2019
Annual Report

Cancer Prevention & Research Institute of Texas

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REPORT FROM THE CHIEF EXECUTIVE OFFICER

CPRIT awarded 139 grants totaling $278.8 million to 33 academic institutions, community organizations, and companies across the state in fiscal year 2019, building on the momentum launched twelve years ago with Texas' historic decision to invest $3 billion for cancer research and prevention. Texas' pledge is the only commitment of its kind and scope in the United States.

The $2.4 billion Texas has invested in 1,452 innovative cancer research and prevention projects over the past decade is critically important because, despite advances, cancer remains the leading cause of death for Texans under the age of 85, with 125 people dying from cancer every day in Texas. More children and adolescents die from cancer in this state than any other disease; cancer killed more than 200 Texas children and adolescents in 2019.

Although the tragic emotional and physical toll of cancer is incalculable, in purely economic terms cancer cost the state $42.5 billion in direct medical costs and mortality losses in 2019. This is $2.2 billion more than 2018. Considering Texas' emerging demographics and growing population, the state's cost of cancer is unlikely to decline unless Texas makes significant and sustainable changes now.

Recognizing this, the 2019 Texas Legislature committed to protecting and leveraging the state's unprecedented investment in innovative cancer research and prevention efforts. In a unanimous Senate vote and near-unanimous House vote, legislators authorized a statewide election to dedicate an additional $3 billion to drive Texas' momentum in the fight against cancer into the next decade. On November 5, 2019, Texans responded, overwhelmingly approving Proposition 6.

An independent economist reports that the positive impact of the passage of Proposition 6 is significant. The expected gross cumulative ten-year benefits of extending CPRIT include $125.4 billion in gross product and over 1.2 million job-years of employment. The gross fiscal gains over ten years are nearly $6.8 billion for the state and $3.1 billion to local governments.

CPRIT is now a $6 billion 20-year initiative—the largest state research investment in the history of the United States and the second largest cancer research and prevention program in the world. Our focus is on the gains to be made over the next decade and we will work with state leadership and stakeholders to identify new opportunities for innovation in cancer research and prevention efforts in Texas. This report outlines the process that CPRIT will use to develop its plan and program priorities for "CPRIT 2.0."

As Texas' fight against cancer escalates exponentially, our work remains true to CPRIT's three-part mission the Texas Legislature first set in statute and the Texas Constitution twelve years ago:

- Invest in the research prowess of Texas universities and research organizations;

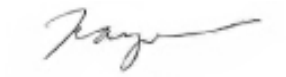
- Create and expand life science infrastructure across the state; and
- Expedite innovation in research and enhance the potential of breakthroughs in preventions and cures.

CPRIT has improved the health and quality of life for Texans in all 254 counties. An early indicator that Texas' investment is making strides is the eight percent drop in the state's cancer death rate between 2011 and 2017, the last year for which data are available. Examples and personal stories recorded in this report and on CPRIT's website illustrate the real-life benefits to Texans better than any statistical measure reveals.

We are improving Texas' national standing in both cancer research and the biomedical industry. As you study the social, economic, and personal impacts of CPRIT's activities, keep in mind that the Institute and its grantees provide these benefits with an extraordinarily low overhead. CPRIT's grantees may not spend more than five percent of grant funds on indirect costs. Similarly, the Institute's overhead comprises less than five percent of the total amount appropriated to the agency annually. When considered in the context of CPRIT's $1.4 billion active grant portfolio, our annual operational costs are less than 1.5% of total funds under management.

CPRIT is often asked the question, "When are you going to cure cancer?" Well, we are curing cancer now, one discovery at a time. Our grantees are making prevention and cures for cancer possible with every advancement. CPRIT's investments connect universities, researchers, physicians, companies, hospitals, and clinics across Texas forming a critical infrastructure of distinguished cancer-fighting talent. CPRIT is proud to be part of this connectivity. Projects we fund have created high quality jobs, supported critical lab infrastructure assets, and along the way, helped thousands of cancer patients extend their lives. CPRIT is delivering promised benefits today.

We are grateful for those who are working to reduce the burden of cancer across the state every day. Their dedication and support inspire us in our efforts to serve Texans. On behalf of the CPRIT Oversight Committee and the Institute's staff, we appreciated the opportunity to make 2019 another productive year. Through CPRIT and in thousands of personal ways, *Texans Conquer Cancer*. We look forward to continuing our mission to improve the health and lives of our fellow Texans.



Wayne R. Roberts
Chief Executive Officer

THE COST OF CANCER IN TEXAS AND THE STATE'S RESPONSE

The Texas Cancer Registry estimates that doctors diagnosed 124,000 new cases of cancer in Texas in 2019, with nearly 46,000 Texans dying of the disease this year. Cancer is the leading cause of death for people younger than 85 and will surpass heart disease as the overall leading cause of death within this decade.

Unfortunately, even with the advances made in cancer research and prevention over the past 55 years, cancer remains so prevalent that one in three women and one in two men alive today will develop some type of cancer. Improvements in treatment and earlier detection mean that the number of people diagnosed and living with cancer in the state will continue to increase as Texas' population grows and ages.

Cost of Cancer to Texas

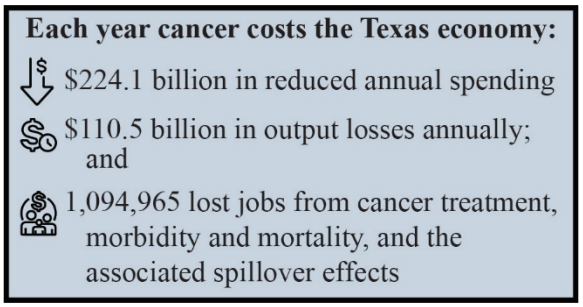
Even without considering cancer's social and emotional toll, the economic cost of cancer in Texas is staggering. The state, private insurance, Medicare, other third-party payers, and cancer patients and their families paid $18.2 billion in cancer-related expenses in fiscal year 2018 (the latest information available.)

FY 2018* Cancer-Related Expenditures in Texas

State Funds Expended by Initiative/Organization	
Children's Health Insurance Program	$10.5 million
Texas Medicaid	$319.2 million
Teacher Retirement System of Texas	$647.7 million
Employees Retirement System of Texas	$357.0 million
Total	**$1.3 billion**
Non-State Funds Expended by Initiative/Organization	
Private Insurance Companies	$7.3 billion
Other Third-Party Payers	$3.0 billion
Medicare	$4.4 billion
Patient Out-of-Pocket Costs	$2.2 billion
Total	**$16.9 billion**
Cancer-Related Expenditures Paid by State and Non-State Entities	
Total	**$18.2 billion**

** Most recent information available*

According to the Perryman Group's 2019 report, *An Economic Assessment of the Cost of Cancer in Texas and the Benefits of the Cancer Prevention and Research Institute of Texas (CPRIT) and its Programs*, direct medical costs in addition to the morbidity and mortality losses in the state totaled $42.5 billion in 2019, up from $40.3 billion in 2018 and $38.7 billion two years ago. These totals represent about 5.8 percent of the total output of the Texas economy, 5.7 percent of earnings, and 6.1 percent of employment.



Availability of Cancer Research Funding from Other Sources

The National Cancer Institute (NCI) is the principal source of funding for cancer research and training in the United States. In 2019 Congress provided NCI a base appropriation of $5.74 billion, which represented a $79 million increase over 2018, and an additional $400 million for the Beau Biden Cancer Moonshot authorized by the 21st Century Cures Act of 2016.

Despite a rising overall budget, various priorities and a ballooning number of funding applications are stretching NCI's funds. The agency has seen a 46% increase in applications since 2013, while requests to the entire National Institutes of Health rose just 10.5% over the same period.

The scientific community attributes the surging interest in NCI funding to "a very exciting time" in cancer research and the growing number of junior investigators seeking grants. Consequently, NCI was able to fund only eight percent of applications from individual investigators in 2019.

Leveraging CPRIT Funding to Bring More Federal Funding to Texas

CPRIT's $1.7 billion investment in cancer research at Texas institutions of higher education over the past decade is demonstrably making the state a national leader in cancer research and making Texas more competitive for NCI research dollars. Despite the increased demand for NCI funding, Texas investigators and institutions have continued to boost the amount of money received from the NCI. Texas researchers attracted $272 million in 2019 - a 10% increase over 2018.

The growing number of nationally competitive cancer researchers in Texas over the past decade is responsible for the encouraging upward trend in NCI funding. Before CPRIT, Texas had one NCI-Designated Comprehensive Cancer Center - The University of Texas MD Anderson Cancer Center. Now there are three. The University of Texas Southwestern Medical Center and Baylor College of Medicine have joined MD Anderson in this prestigious group.

By conferring the "Designated Cancer Center" status, NCI recognizes an institution for its scientific leadership, resources, and depth and breadth of its research in basic, clinical, and/or population science. NCI cancer centers anchor the national cancer research effort. There are 71 centers in 36 states and the District of Columbia forming the backbone of NCI's programs for studying and controlling cancer.

CPRIT's significant and sustained grant funding to The University of Texas Southwestern Medical Center and Baylor College of Medicine was a major factor assisting these institutions to attain their comprehensive center designations. In addition, CPRIT grants have helped The University of Texas Health Science Center at San Antonio, an NCI Designated Cancer Center, solidify its position and prepare to regain comprehensive status. The cancer center designation is crucial to Texas' upswing in federal funding. Cancer center investigators are measurably more successful in the competition for research funding from NCI and other funding agencies and organizations. Research proposals from cancer center investigators account for about three-quarters of the successful investigator-initiated grants awarded by NCI.

Particularly notable is the 18% increase in NCI funding in 2019 to The University of Texas MD Anderson Cancer Center, which received $124 million. This is second only to the Dana Farber Cancer Center in Massachusetts, which received $125 million last year. Also impressive is the boost in annual NCI funding to The University of Texas Southwestern Medical Center, which received $55 million in 2019 compared to $16 million a decade ago.

More Texas institutions are poised to gain NCI center status with continued grant support from CPRIT. Texans benefit through greater access to clinical trials and receive advanced levels of cancer treatment not available through other health care providers. The enhanced standing of Texas' cancer centers also contributes to the state's medical education and research efforts, resulting in higher quality and greater levels of knowledge and specialization. All these activities elevate the state's reputation in medical care and advanced research.

CPRIT's Economic Impact for Texas

CPRIT continues to play a vital role as the state's primary, stable source of cancer research and prevention funding. CPRIT's efforts also enhance Texans' prosperity by reducing the economic costs of cancer. An independent economist estimates that every dollar spent on prevention screening saves $2.18 in direct health spending. Including initial outlays and secondary effects, every dollar that CPRIT invests in earlier detection through cancer screening projects results in $28.81 savings in treatment costs, preserved productivity, and other economic benefits.

Given the results over the first ten years and the magnitude of the gains realized from extending CPRIT and its programs, CPRIT more than pays for itself through benefits to the Texas economy.

CPRIT's Statutory Authority and Governing Body

CONSTITUTIONAL AND STATUTORY AUTHORITY

Created by the Texas Legislature and first approved by Texas voters in 2007, CPRIT began awarding grants in 2009 to Texas-based academic institutions, companies, and community organizations for the research and development of cancer-related treatments and the delivery of cancer prevention programs and services.

Faced with the exhaustion of CPRIT grant funds by 2021, the 86th Regular Session of Texas Legislature took up the issue of reauthorizing CPRIT and the state's commitment to cancer research and prevention efforts. In a unanimous Senate vote and near-unanimous House vote, legislators sanctioned a statewide election to commit an additional $3 billion in general obligation bond proceeds to drive Texas' momentum in the fight against cancer into the next decade. On November 5, 2019, Texans responded, overwhelmingly approving Proposition 6.

Following the November 5 election, the Texas Constitution, Article III, Section 67, as amended, permits the state to issue up to $6 billion in general obligation bonds for CPRIT research and prevention grants and to fund CPRIT operations.

Texas may issue no more than $300 million in bonds annually for these purposes, and CPRIT may not award in excess of $300 million in grants each year.

CPRIT is now a $6 billion, 20-year initiative - the largest state research investment in the history of the United States. CPRIT's governing statute, Texas Health & Safety Code Chapter 102, guides all aspects of the agency's operations.

CPRIT's statute directs the agency to:

- Create and expedite innovation in cancer research, and enhance the potential for a medical or scientific breakthrough in the prevention of cancer and cures for cancer;
- Attract, create, or expand research capabilities of public or private institutions of higher education and other public or private entities that will promote a substantial increase in cancer research and in the creation of high-quality new jobs in this state; and
- Develop and implement the Texas Cancer Plan.

CPRIT OVERSIGHT COMMITTEE

The statutorily created Oversight Committee serves as the Institute's governing body. In addition to establishing priorities for each of CPRIT's three program areas, the Oversight Committee approves grant awards and may adopt policies and practices necessary for the conduct of its meetings, management of the agency, and the awarding of grants.

The Oversight Committee convenes in a public meeting at least once every quarter. In fiscal year 2019 the Oversight Committee met November 28, 2018, February 21, 2019, May 15, 2019, and August 21, 2019. In step with CPRIT's commitment to transparency in its operations and grant award process, Oversight Committee meeting agendas, meeting packets, minutes, and meeting videos are available on CPRIT's website.

Oversight Committee Members

The Governor, the Lieutenant Governor, and the Speaker of the House each appoint three private citizens to serve as Oversight Committee members for six-year terms. At least one member appointed by each of the officers must be a physician or scientist with experience in oncology or public health.

As directed by the statute, the Oversight Committee elects a presiding officer, assistant presiding officer, and secretary. The process set by the committee bylaws calls for an election every odd-numbered year. For fiscal years 2018 – 2019, Will Montgomery served as Presiding Officer, with the Honorable Donald "Dee" Margo serving as Vice Presiding Officer, and Dr. Mahendra Patel serving as Board Secretary.

The Oversight Committee voted at its August 21, 2019, meeting, unanimously electing Mr. Margo as Presiding Officer, Dr. Patel as Vice Presiding Officer, and Dr. David Cummings as Board Secretary for fiscal years 2020 - 2021. Their terms expire in August 2021.

Oversight Committee Members for Fiscal Year 2019

Appointed by the Governor

Angelos Angelou Term: 9/26/2013 - 1/31/2019	**David A. Cummings, M.D.** Term: 8/27/2018 - 1/31/2023	**Donald "Dee" Margo, II** ***Assistant Presiding Officer*** Term: 5/20/2015 - 1/31/2021

Appointed by the Speaker

Will Montgomery ***Presiding Officer*** Term: 11/20/2013 - 1/31/2023 (Reappointed 2/10/2017)	**Mahendra C. Patel, M.D.** ***Committee Secretary*** Term: 9/15/2017 - 1/31/2021	**William Rice, M.D.** Term: 11/14/2017 - 1/31/2025*

Appointed by the Lt. Governor

Craig Rosenfeld, M.D. Term: 9/26/2013 - 1/31/2017	**Vacant**	**Vacant**

** Speaker Bonnen reappointed Dr. Rice on January 6, 2020.*

Oversight Committee Program Priorities

CPRIT'S PROGRAM PRIORITIES

The Texas Legislature amended CPRIT's statute in 2013, charging the Oversight Committee with establishing priorities on an annual basis for each of the Institute's three award programs. After a six-month deliberative process that included input from CPRIT's stakeholders the Oversight Committee approved its first program priorities in November 2014.

The priorities guide the development and issuance of CPRIT's Requests for Applications (RFAs) and focus the review of applications submitted for grant awards. During the annual review of its priorities, the Oversight Committee considers the latest information concerning cancer-related advances in prevention, academic research, and product development research and may modify one or more priorities to signal new areas of program emphasis.

When it affirms the program priorities annually, the Oversight Committee notes that the priorities are not exclusionary. A guiding principle underlying all three programs is that applications with scientific and programmatic merit move forward in CPRIT's peer review grant process. CPRIT will continue to fund compelling, innovative projects even if they are outside of current priorities.

Long Term Focus

Accelerating innovation in cancer research and prevention requires comprehensive planning for current operations as well as longer-term goals. Seeing the results set in motion by a specific priority often requires several years of concentrated effort by CPRIT and its grantees. For this reason, the Oversight Committee continues to approve many of the same priorities to guide the programs over several years rather than making wholesale changes each year.

An example of the long-term benefits resulting from CPRIT's consistent, sustained support for a designated priority is the Institute's focus on childhood and adolescent cancer, which is a historically underfunded area nationally.

The Oversight Committee prioritized fast-tracking progress in the prevention and research of pediatric and adolescent cancer in 2014 and continues to annually reaffirm its status as a CPRIT priority. Because of this multi-year commitment, the number of grant applications and grant awards for projects addressing childhood and adolescent cancer have increased substantially.

CPRIT has funded 149 academic research, product development research, and prevention projects targeting childhood and adolescent cancer as of August 31, 2019. This focus area is 12% of CPRIT's total investment in cancer research and prevention projects, which is three times the level (on a comparative basis) that the federal government dedicates to the same area. Texas is becoming a global leader in childhood cancer research.

Another example of the benefits gained through CPRIT's long-term vision for its programs is the Institute's commitment to

recruiting and training outstanding cancer researchers.

Bringing cancer scientists and clinicians, at all career levels, to academic institutions in Texas and supporting programs that train pre- and post-doctoral fellows establishes a critical mass of cancer researchers in Texas. CPRIT's recruitment program has been successful in enhancing Texas' cancer research efforts and increasing the external visibility of the state in the medical and scientific communities.

Fiscal Year 2019 Priorities by Program

The Oversight Committee adopted the priorities, listed below by program, for fiscal year 2019 at its January 17, 2018 meeting.

Fiscal Year 2019 Academic Research Program Priorities

- Recruitment of outstanding cancer researchers to Texas
- Investment in core facilities
- A broad range of innovative, investigator-initiated research projects
- Implementation research to accelerate adoption and deployment of evidence-based prevention and screening interventions
- Computational biology and analytic methods
- Childhood cancers
- Hepatocellular cancer

Fiscal Year 2019 Product Development Research Program Priorities

- Funding novel projects that offer therapeutic or diagnostic benefits not currently available; *i.e.*, disruptive technologies
- Funding projects addressing large or challenging unmet medical needs
- Investing in early stage projects when private capital is least available
- Stimulating commercialization of technologies developed at Texas institutions
- Supporting new company formation in Texas or attracting promising companies to Texas that will recruit staff with life science expertise, especially experienced C-level staff to lead to seed clusters of life science expertise at various Texas locations
- Providing appropriate return on Texas taxpayer investment

Fiscal Year 2019 Prevention Program Priorities

- Populations disproportionately affected by cancer incidence, mortality, or cancer risk prevalence
- Geographic areas of the state disproportionately affected by cancer incidence, mortality, or cancer risk prevalence
- Underserved populations

Fiscal Year 2019 Priorities For All Programs

CPRIT's structure presents a unique opportunity for funding projects that span the continuum from scientific discoveries in university labs to the development of cancer drugs and delivery of evidence-based prevention services to the public - creating synergy across the spectrum. While CPRIT funds a broad range of programs and cancer types, selecting areas of emphasis directs CPRIT resources and guides decisions to

where CPRIT may have the most impact and distinguish it from other funding sources.

The Oversight Committee establishes priorities across CPRIT's academic research, product development research, and prevention programs to balance CPRIT's portfolio to address unmet needs. These are areas in the cancer research and care continuum where existing institutions have not provided strong results.

The fiscal year 2019 priorities across programs include:

- *Prevention and Early Detection Initiatives*

A comprehensive approach to controlling cancer that focuses solely on discovering cures for advanced disease has serious limitations. Cancer cells have a remarkable ability to develop resistance to radiation, chemotherapy, and even targeted therapy treatments, thwarting efforts for cures.

Detecting cancer early in its development is a better approach to comprehensive cancer control, but these areas of cancer research receive little funding relative to resources devoted to curing advanced cancer. Yet, Nowhere is there greater potential to reduce the burden of cancer than by reducing its incidence. This spares patients and their families the psychological and emotional trauma of a cancer diagnosis, and the physical toll and the financial burden of treatment.

- *Early Translational Research*

A well-documented impediment to bringing the results of basic research to bear on cancer is the shortage of funding to translate new discoveries into practical advances available to cancer patients. Research and development must take place between the stages of discovery science, traditionally funded by grants from federal sources and foundations, and late term development and commercialization of drugs, devices, diagnostic tests, and biologicals traditionally funded by private sector industries.

Bridging the gap between basic research and product development, and between research on preventive measures and innovative technologies for early detection and adaptation of tested interventions, represents opportunities for inter-program strategic investment by CPRIT. The Institute's support for research and development in this transitional space also stimulates public-private partnerships and brings new commercial investments to Texas.

- *Enhancing Texas' Research Capacity and Life Science Infrastructure*

CPRIT's statute emphasizes boosting research superiority, improving applied science and technology research capabilities, and increasing high-quality jobs in the state. All three programs contribute to developing the research, life science and cancer control workforce and infrastructure in the state.

Monitoring Program Performance

CPRIT also develops, monitors, and evaluates additional performance measures throughout the fiscal year to document success at meeting strategic objectives, including developing cures and treatments and preventing cancer when programmatically appropriate. CPRIT staff reports at each quarterly Oversight Committee meeting on 45 accountability, mission, and transparency metrics. In addition to fiscal accountability reviews by CPRIT's Compliance Program, non-Texas professionals with substantive experience in their appropriate fields objectively evaluate grantee progress reports. These annual reviews of every active CPRIT-funded project verify that the grantees are carrying out the qualitative work specified in the grant contract and are performing as intended.

CPRIT Grant Programs

CPRIT GRANT AWARDS
FISCAL YEAR 2019

AWARDED GRANTS

GRANT FUNDS

GRANT RECIPIENTS

Cell Medica	Instapath, Inc.	Rice University	The Rose
Texas Medical Center	Baylor College of Medicine	OncoNano Medicine	Perimeter Medical Imaging Corp.
Allterum Therapeutics, LLC	Texas A&M University	Texas Agrilife Research	Icell Kealex Therapeutics LLC
Texas Southern University	Texas Tech University	Hummingbird Bioscience, Inc.	The University of Texas at Arlington
The University of Texas at Austin	The University of Texas at Dallas	The University of Texas at Tyler	University of Houston
Texas Tech University Health Sciences Center	Legacy Community Health Services	The Methodist Hospital Research Institute	The University of Texas at San Antonio
Texas A&M University System Health Science Center	The University of Texas Southwestern Medical Center	The University of Texas MD Anderson Cancer Center	The University of Texas Health Science Center at Houston
Texas Tech University Health Sciences Center at El Paso	The University of Texas Health Science Center at San Antonio	The University of Texas Medical Branch at Galveston	Emtora Biosciences (formerly Rapamycin Holdings)
Texas A&M University Health Science Center Institute of Biosciences			

ACADEMIC RESEARCH PROGRAM AT-A-GLANCE

Over the past decade Texas has emerged as a cancer research powerhouse. CPRIT investments in basic, translational, clinical, and population research - now exceeding $1.7 billion – increase Texas' research prowess and provide the catalyst for development of new centers of cancer research excellence based at institutions across the state and boost Texas' national and international reputation in cancer research. Most importantly, CPRIT research investments have led to new life-saving treatments and prevention strategies that save the lives of Texans.

108	FY 2019 Academic Research Grants Awarded
$163.8M	FY 2019 Academic Research Grant Funds Awarded
37	Texas Institutions Receiving Academic Research Grants
$1.7B	Academic Research Grant Funds Awarded to 1,178 Academic Research Projects

RECRUITING TALENT TO TEXAS

In fiscal year 2019, Texas added 24 talented CPRIT Scholars to the state's stable of prestigious research scholars. Through August 31, 2019, CPRIT has recruited 181 premier cancer researchers to 18 Texas institutions. CPRIT Scholars coming to Texas bring novel expertise, catalyzing new centers of research excellence across Texas. These researchers, together with state's homegrown talent, are creating the critical mass of science needed to attract capital for the development of cancer treatments and diagnostics.

RESEARCH RESULTS

CPRIT grantees have filed 382 patents and published nearly 5,000 articles detailing research results funded by CPRIT.

SELECTING THE BEST SCIENCE

140 peer reviewers evaluated 646 academic research applications submitted in fiscal year 2019. CPRIT academic research award applications undergo rigorous scientific reviews conducted by seven independent peer review panels. The peer review panels are composed of prominent cancer researchers that live and work outside of Texas, selected for their expertise. These experts assess the research proposals based on scientific merit and potential impact on cancer and make recommendations to the Oversight Committee.

ADDITIONAL FUNDING RAISED

CPRIT grantees have raised an additional $1.4 billion in non-state funds to support and extend CPRIT-funded projects.

TRAINING THE NEXT GENERATION

23 CPRIT-funded training projects have educated 1,197 undergraduate students, graduate students, clinician trainees, and pre- and post-doctoral students. Training programs supported by CPRIT develop the next generation of cancer researchers, increase the diversity of the cancer research workforce, and are important to growing and sustaining the state's life sciences infrastructure.

CPRIT'S UNIQUE VALUE PROPOSITION FOR ACADEMIC RESEARCH

CPRIT supports the most creative ideas and meritorious projects brought forward by the cancer research community in Texas. The overarching principles for awarding CPRIT funds are scientific excellence and impact on reducing the burden of cancer, both of which are critically important to enhance the life sciences infrastructure in Texas. This enables CPRIT's effect on cancer research to extend for years beyond the lifetime of the program. The goals of CPRIT's Academic Research Program are to:

- Discover new insights about cancer that can lead to prevention, early detection, and more effective treatments
- Translate discoveries into practical advances in cancer diagnosis, treatment, and survivorship
- Increase the prominence and stature of Texas in the fight against cancer

In addition to the investments in recruitment, training, and core facilities, CPRIT's Academic Research Program is committed to funding projects in critical but underfunded areas of cancer research. Opportunities for the strategic deployment of funds include cancer prevention and early detection research, computational biology and analytic methods, childhood cancers, and cancers of importance in Texas with a special emphasis on hepatocellular cancer because of the recent dramatic rise in its incidence in Texas.

NOTABLE ACADEMIC RESEARCH PROGRAM HIGHLIGHTS FOR FISCAL YEAR 2019

On October 1, 2018, the Nobel Committee awarded CPRIT Scholar Jim Allison, Ph.D., the 2018 Nobel Prize in Physiology or Medicine for launching an effective new way to attack cancer by treating the immune system rather than the tumor. M.D. Anderson recruited Dr. Allison to Texas to head its Immunology Department in 2012 with the help of a $10 million CPRIT grant.

CPRIT launched a new initiative "*The Collaborative Action Program to Reduce Liver Cancer Mortality in Texas*" aimed at reversing the increasing rate of liver cancer deaths in Texas. Texas has the second highest incidence of liver cancer in the U.S. CPRIT awarded the first ever Collaborative Action Program grants to Dr. El-Hashem El-Serag at Baylor College of Medicine and Dr. Jessica Hwang at The University of Texas MD Anderson Cancer Center.

Texas Southern University received its first of two CPRIT research awards in fiscal year 2019: a $5.1 million grant supporting the state-of-the-art drug development core facility *Gulf Coast Consortia Center for Comprehensive PK/PD & Formulation* and a $200,000 High Risk/High Impact award addressing cancer treatment side effects.

The MacArthur Foundation awarded CPRIT grantee Dr. Livia Eberlin a "genius grant" in recognition of her invention of the MassSpec Pen, a handheld device that identifies cancerous tissue within 10 seconds during surgical procedures. Dr. Eberlin, an assistant professor of chemistry at The University of Texas at Austin, has received $2.4 million in CPRIT grants for the MassSpec Pen's development and testing.

The National Academic of Medicine (NAM) announced the membership election of CPRIT Scholar Dr. Sean Morrison, professor of Pediatrics at The University of Texas Southwestern Medical Center and director of the Children's Medical Center Research Institute. This is one of the highest honors in the fields of health and medicine. NAM also named CPRIT Scholar Ning (Jenny) Jiang, Ph.D., associate professor in The University of Texas at Austin Cockrell School of Engineering and Dell Medical School, an "Emerging Leader in Health and Medicine."

CPRIT grantee, Dr. Ralph DeBerardinis, professor of Pediatrics at The University of Texas Southwestern Medical Center, received the 2019 O'Donnell Award from The Academy of Medicine, Engineering and Science of Texas. The O'Donnell Award recognizes outstanding achievements by Texas early career investigators.

The American Society of Clinical Investigators (ASCI) voted to extend membership to CPRIT Scholar Dr. Hao Zhu, associate professor of Internal Medicine at The University of Texas Southwestern Medical Center. ASCI selects physician-scientists under the age of 50 for outstanding records of scholarly achievement in biomedical research.

U.S. News & World Report ranked Texas Children's Hospital, affiliated with CPRIT grantee Baylor College of Medicine, No. 3 for care in pediatric cancer.

CPRIT grantee Zhijian "James" Chen, Ph.D., professor of Molecular Biology at the University of Texas Southwestern Medical Center received the prestigious 2019 Breakthrough Prize in Life Sciences for his

discovery of the cGAS enzyme that launches the body's immune defense against infections and cancers.

David Johnson, M.D., CPRIT Scholar and chair of Internal Medicine at The University of Texas Southwestern Medical Center, is one of fifteen world-renowned leaders in hematology and oncology inducted into the 2019 class of "Giants of Cancer Care."

CPRIT-SUPPORTED RESEARCH FINDINGS REPORTED BY TEXAS ACADEMIC INSTITUTIONS IN FISCAL YEAR 2019

CPRIT funded research led by Dr. Manjeet Rao, associate professor of cell systems and anatomy at The University of Texas Health Science Center at San Antonio and a member of the Greehey Children's Cancer Research Institute, **found a molecule able to kill medulloblastoma**, the most common childhood brain cancer. The molecule under study sensitizes cancer to chemotherapy and radiation, making it plausible to treat tumors with one-tenth the dose required currently. *Nature Communications* reported Dr. Rao's research in October 2018.

CPRIT Scholar Dr. Kathryn O'Donnell, Assistant Professor of Molecular Biology at The University of Texas Southwestern Medical Center, has **discovered an enzyme on the surface of some lung cancer cells that helps feed the cancer**, making it a tempting treatment target. A study published in the November 20, 2018, edition of the journal *Cell Reports* describes the enzyme, transmembrane serine protease 11B. Her team identified the enzyme while searching for genes that can convert precancerous lung cells into malignant cells that form tumors. Because most healthy cells appear to lack the enzyme identified by Dr. O'Donnell's team, it is the perfect cancer drug target - it is accessible on the tumor cell surface, it is selective for cancer cells, blocking it both inhibits the cancer growth and sets the stage for developing better immunity against the cancer, and its presence makes it a diagnostic.

CPRIT-funded research at The University of Texas Southwestern Medical Center **found that a combination of drugs – one targeting epidermal growth factor receptor (EGFR) and one targeting tumor necrosis factor (TNF) – effectively blocks the cancer from using TNF as an escape route** from the targeting of EGFR. Using a mouse model, Dr. Amyn Habib, associate professor of Neurology and Neurotherapeutics, also showed that blocking TNF sensitizes the cancer to EGFR treatment. Based on these findings, reported in the January 24 edition of the *Journal of Clinical Investigation*, UT Southwestern researchers are planning a clinical trial of a two-drug strategy targeting both EGFR and TNF in lung cancer patients and those with glioblastomas.

CPRIT Scholar Dr. Chonghui Cheng, associate professor at Baylor College of Medicine, **identified how some breast cancer cells can change, making them resistant to treatment**. Her research, published January 28 in the journal *Genes & Development*, found that breast cancer cells can shift between two different forms of the cell surface protein CD44. Researchers envision that by manipulating the levels of the two forms of CD44, it may be possible to change the cancer cell properties in ways that may enhance the cancer's susceptibility to treatment. (January 28, 2019)

A CPRIT-funded research program led by Dr. Giulio Draetta, Chief Scientific Officer at The University of Texas MD Anderson Cancer Center, **discovered that malignant rhabdoid tumors, a rare pediatric cancer without effective treatments, are sensitive to drugs that block the cancer cell's ability to dispose**

of misfolded proteins. The findings provide a much-needed therapeutic target for these and other cancers caused by mutations in the SMARCB gene. Based on these findings, published February 11 in *Cancer Cell*, the researchers are leading a clinical trial to test this approach in renal medullary carcinoma, a related adolescent cancer also characterized by SMARCB1 mutations. (February 11, 2019)

Baylor College of Medicine investigators **reported on a major treatment breakthrough for childhood and adult osteosarcoma** at the American Association for Cancer Research annual meeting in March. Significant clinical responses occurred in 5 of 10 patients treated with their own blood cells that researchers genetically modified to recognize their cancer. One of the first CPRIT MIRA grants awarded in 2010 supported the development of this immune cell therapy for osteogenic sarcoma. Most exciting was the report that one teenage patient with metastatic osteosarcoma treated on the trial had a complete resolution of her disease that has now continued for 32 months.

Research led by CPRIT Scholar Dr. Joshua Mendell, professor of Molecular Biology at The University of Texas Southwestern Medical Center, has **identified a genetic pathway that prevents premature aging** in a mouse model. Published February 8 in *eLife*, the study examined the role of NORAD, a gene that Dr. Mendell discovered in 2015 that is important in maintaining the correct number of chromosomes in human cells as they divide. The researchers found that the loss of NORAD caused chromosomal defects in mice. They also discovered that removing NORAD causes mitochondrial function to become significantly abnormal. The mice also appeared to age rapidly. If disruption of NORAD is part of the aging process as this research finding suggests, then it will be important to understand the mechanisms through which the disruption occurs. Eventually, this research could lead to an ability to prevent or reverse the aging process.

CPRIT Scholar Dr. Natalia Krienko, assistant professor of Biosciences at Rice University, reported in the March 13 edition of *PLOS Genetics* how a B12-deficient diet harms roundworms' health by reducing the roundworms' ability to metabolize branched-chain amino acids. The reduced ability to break down branched-chain amino acids leads to a buildup of toxic byproducts that damage mitochondria. Dr. Krienko's research on **the effects of a B12-deficient diet identifies a potential new target to attack cancer cells**.

Dr. Zhijian "James" Chen, professor of Molecular Biology at The University of Texas Southwestern Medical Center, and CPRIT First Time Tenure Track Scholar Dr. Xiaochen Bai reported in two papers published March 16 in *Nature* on key **discoveries made regarding the structure of the STING protein**. The STING protein is a key member of an important pathway in innate immunity, the body's first line of defense against foreign invaders and a potential target for a new generation of cancer immunotherapies. The CPRIT-funded scientists made their discovery using UT Southwestern' s new cryo-electron microscopy resource. UT Southwestern invested $17 million to acquire and house a collection of instruments capable of performing cryo-electron microscopy that is unique in the United States. A CPRIT Core Facility grant helped to advance the facility,

making these powerful resources widely available to the cancer research community. Dr. Chen and Dr. Bai's work is one example of the impact that investments in critical infrastructure like the CPRIT cryo-electron microscopy facility is making on accelerating cancer research in Texas.

CPRIT Scholar Dr. Jihye Yun, Assistant Professor of Molecular and Human Genetics at Baylor College of Medicine, published a study in the March 22 edition of *Science* that **implicates fructose, the sugar in corn syrup, in the development of colon cancer**. While current thought is that sugar is harmful to human health mainly because consuming too much can lead to obesity, Dr. Yun's study showed that consuming a daily modest amount of fructose - the equivalent of drinking about 12 ounces of a sugar-sweetened beverage daily - accelerates the growth of intestinal tumors in mouse models of colon cancer, independent of obesity. Her team also discovered the mechanism by which the consumption of sugary drinks can directly feed cancer growth, suggesting potential novel therapeutic strategies.

CPRIT Scholar Dr. Bing Zhang, professor of molecular and human genetics at Baylor College of Medicine, led a multi-institutional study published on May 2 in the journal *Cell* that has analyzed all the proteins and genes in tissue samples from a group of patients with colon cancer and then applied bioinformatics to create a catalog of the differences in proteins in the colon cancer tumors versus the normal colon. Through bioinformatics analyses, Dr. Zhang and his colleagues **identified new clues regarding why immunotherapy does not work for all mismatch repair-deficient colon cancers** that may lead to new therapeutic approaches.

In May, researchers from The University of Texas MD Anderson Cancer Center presented results from Phase 1 studies in patients with solid tumors at the 2019 meeting of the American Society for Clinical Oncology for the first therapy to be developed from concept to clinical trial by MD Anderson's Therapeutics Discovery division. The therapy, IACS-10759, is in clinical development for acute myeloid leukemia as well as for solid tumors and lymphoma. Researchers designed IACS-10759 to inhibit oxidative phosphorylation (OXPHOS) a prominent energy source supporting growth and survival. A comprehensive translational effort enabled by collaboration across MD Anderson and supported in part by CPRIT Individual Investigator Awards has **identified multiple cancers that are highly dependent on OXPHOS** and led to these ongoing clinical trials in patients with leukemia, lymphoma, and solid tumors.

A collaborative team of scientists led by Dr. Philip Lupo, an associate professor of pediatrics at Baylor College of Medicine, reported findings of an important study of cancer risk for children with birth defects in the June 20 issue of *JAMA Oncology*. The study **determined that children with chromosomal anomalies were 12 times more likely to receive a cancer diagnosis**, and children with nonchromosomal birth defects were 2.5 times more likely to have cancer before turning 18 years old. This important study is the largest of its kind and the data can help to understand differences in outcomes for children with cancer.

Dr. Pingwei Li, a professor in the Department of Biochemistry and

Biophysics at Texas A&M University's College of Agriculture and Life Sciences, **identified the key component of the protein, STING, that signals the immune system to produce interferons to fight against viral infections or cancer**. This basic research discovery initially funded by a CPRIT Individual Investigator Research Award led to another $1.8 million in funding from the National Institutes of Health. These findings provide a basis for the development of novel STING binder and blocker drugs for use against viral infection, cancer, and autoimmune disorders.

Chemists at The University of Texas at Dallas, supported by CPRIT High Risk High Impact and Individual Investigator Research awards, are using the natural detoxification process in the liver to improve disease targeting of engineered nanoparticles nanomedicines. Their key discovery, reported in the July 15 edition of the journal *Nature Nanotechnology*, found in a mouse model that **the liver's natural toxin-removal processes can be used to enhance the delivery of nanomedicines while also making them safer** by eliminating the nanomedicines that miss the target. Scientists have viewed liver uptake as a barrier to nanomedicine delivery; this new strategy utilizes liver behavior, once considered a disadvantage to the clinical translation of nanomedicines, as an advantage.

CPRIT Scholar Dr. Filippo Giancotti, professor of Cancer Biology at The University of Texas MD Anderson Cancer Center, **discovered how an aggressive form of prostate cancer metastasizes by evading the immune system**. He found that an epigenetic regulator known as the polycomb repressor complex 1 (PRC1) coordinates the initiation of metastasis by increasing the regenerative capacity of metastatic cells and by suppressing the immune system and spurring tumor blood vessel growth or angiogenesis. Together with other investigators, Dr. Giancotti also developed a novel in-class inhibitor of PRC1 which, when given in combination with existing immunotherapies, appears to stop and even reverse metastasis in mouse models. Dr. Giancotti published these findings in the July 18 online issue of *Cancer Cell.*

A new molecular mechanism discovered by researchers at The University of Texas Southwestern Medical Center indicates that PARP inhibitors, a class of drugs currently used to treat a subset of breast cancer patients, may have broader effectiveness in treating breast cancers and ovarian and prostate cancers. Two CPRIT individual investigator awards to Dr. W. L. (Lee) Kraus, a UT Southwestern professor in the Department of Obstetrics and Gynecology, supported the new study reported in the July 24 issue of *Molecular Cell*. The FDA approved PARP inhibitors for the treatment of breast and ovarian cancers containing BRCA mutations, rare genetic mutations that disable a DNA repair pathway in cancer cells. Dr. Kraus' lab discovered that while the DNA repair pathway is disabled, PARP inhibitors attack the machinery that makes proteins, called ribosomes. These findings could increase the patient population benefiting from these drugs by two, three, or four-fold. UT Southwestern is planning clinical trials to pursue this new lead.

ACADEMIC RESEARCH GRANTEE SPOTLIGHT

The University of Texas MD Anderson Cancer Center recruited **Dr. Christopher Flowers** to Texas from Emory University with the support of CPRIT Established Investigator Recruitment Award approved in August 2019. He now leads MD Anderson's Department of Lymphoma/Myeloma.

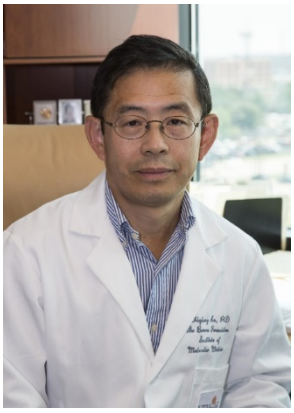
Dr. Flowers is a medical oncologist whose research has made major contributions to understanding of the heterogeneity of lymphoma and the biological aspects of racial disparities in survival. At MD Anderson Cancer Center he plans to create a Texas-based lymphoma cohort with special focus on African American patients to continue his internationally recognized research on racial disparities in lymphoma.

A Seattle native, Dr. Flowers attended undergraduate school at Stanford University in the Human Biology and Humanities Honors Programs. He received his medical degree from Stanford University, where he also received a master's degree in Medical Information Sciences. Post graduate training took him back to Seattle for his residency in medicine at the University of Washington and fellowships in the Robert Wood Johnson Clinical Scholars Program and medical oncology at the Fred Hutchinson Cancer Research Center.

For the past 16 years Dr. Flowers, a member of the prestigious American Society of Clinical Investigation, has been on the faculty of the Department of Hematology and Oncology at Emory University where he has become an internationally recognized expert in lymphoma clinical and population science research. His training and expertise in informatics and outcomes research inform Dr. Flowers' seminal contributions to the field by uncovering racial disparities in the presentation and outcomes for several lymphoid cancers and leading cohort studies. This has enhanced understanding of the etiology, outcomes, and survivorship for lymphoma patients.

His groundbreaking efforts in cancer health disparities research provided new insights into the understanding of the clinical manifestations and etiology of racial differences in lymphoma. He will apply his expertise in epidemiology and informatics to enroll newly diagnosed lymphoma patients in Texas in studies that examine the contributions of genomics, socioeconomic status, treatment delivery, and insurance status on disparities in survival. Utilizing expertise in clinical trials and outcomes research, he will design interventions that focus on eliminating disparities in cancer incidence, mortality and access to care.

Dr. Flowers has dedicated much of his career to mentoring trainees at all levels to pursue careers in clinical research. The Georgia Cancer Coalition recognized him for mentorship and clinical investigation with its Distinguished Scholars Award (2005) and the Eckman Award for Excellence in Teaching (2007). He also served as a national leader in the recruitment and mentoring of under-represented minorities to careers in hematology and oncology clinical research. Dr. Flowers plans to continue this commitment to recruit, mentor, and develop the careers of underrepresented minorities interested in cancer research at MD Anderson.



Dr. Zhiqiang An, Professor of Molecular Medicine, the Robert A. Welch Distinguished University Chair in Chemistry, and Director, Texas Therapeutics Institute at The University of Texas Health Science Center at Houston (UTHealth Houston), leads a team that focuses on the discovery and development of therapeutic antibodies and antibiotics against human diseases including cancer and infectious diseases.

Previously, Dr. An served as Chief Scientific Officer at Epitomics, Inc. and was Director of the Biologics Research at Merck Research Laboratories. He started his biotech/pharmaceutical career at Millennium Pharmaceuticals where he worked in the field of biocombinatorial natural products drug discovery using microbial molecular genetics and engineering approaches. Dr. An received his Ph.D. from the University of Kentucky, Lexington, and his postdoctoral training at the University of Wisconsin-Madison.

Dr. An's team at UTHealth Houston has established a comprehensive antibody drug discovery platform focusing on antibody lead optimization technologies such as phage display, deep sequencing of antibody encoding genes from individual antibody expressing B cells, affinity maturation, and humanization.

Through the "Therapeutic Monoclonal Antibody Lead Optimization and Development Core Facility" funded by CPRIT, Dr. An and his team offer Texas-wide access to specialized technical expertise, instrumentation, and automation to advance lead antibodies with "drug like" properties from academic laboratories to the stage of preclinical development.

The American Association for the Advancement of Science name Dr. An a 2019 Fellow. This honor recognizes diverse accomplishments in contributions to science and technology.

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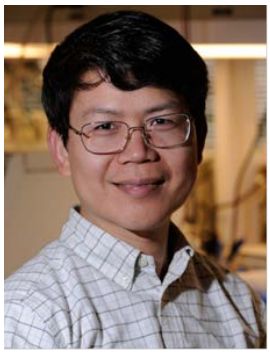

Zhijian "James" Chen, Ph.D., George L. MacGregor Distinguished Chair in Biomedical Science, director of the Inflammation Research Center, and a professor of molecular biology at The University of Texas Southwestern Medical Center, received a $6.9 million CPRIT award to investigate how cGAS links to the development of cancer and to exploit its role in immune defense against malignant cells. Researchers expect this work to lead to new immunotherapy drugs for cancer based on cGAMP and its derivatives used as adjuvants for vaccines and cancer immunotherapies.

Dr. Chen and CPRIT Scholar Dr. Xiaochen Bai reported in two papers published in *Nature* on key discoveries made regarding the structure of the STING protein. The STING protein is a key member of an important pathway in innate immunity, the body's first line of defense against foreign invaders and a potential target for a new generation of cancer immunotherapies. The CPRIT-funded scientists made their discovery using The University of Texas

Southwestern Medical Centers new cryo-electron microscopy resource. UT Southwestern invested $17 million to acquire and house a collection of instruments capable of performing cryo-electron microscopy that is unique in the United States. A CPRIT Core Facility grant helped to advance the facility, making these powerful resources widely available to the cancer research community. Dr. Chen and Dr. Bai's work is one example of the impact that investments in critical infrastructure like the CPRIT cryo-electron microscopy facility is making on accelerating cancer research in Texas.

Dr. Chen, a Howard Hughes Medical Institute Scientist and member of the National Academy of Sciences, received the 2019 Breakthrough Prize in Life Sciences for his discovery of the cGAS enzyme that launches the body's immune defense against infections and cancers. The Breakthrough Prize recognizes achievements in the Life Sciences, Fundamental Physics, and Mathematics.

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Suzanne D. Conzen, M.D joined The University of Texas Southwestern Medical Center in 2019 as a CPRIT Established Investigator and Professor of Internal Medicine and Chief of the Division of Hematology and Oncology. She specializes in diagnosing and treating breast cancer, focusing on the role of the glucocorticoid receptor (GR) in prostate, breast, and ovarian cancers. Prior to her recruitment to Texas, Dr. Conzen was Professor of Medicine at the University of Chicago and a member of the University of Chicago Comprehensive Cancer Center.

Dr. Conzen graduated Phi Beta Kappa and magna cum laude from Brown University with a degree in political science. She then attended Yale School of Medicine where she also trained with Dr. Charles Janeway in cellular immunology.

During medical school, Dr. Conzen studied epidemiology and human nutrition at the London School of Hygiene and Tropical Medicine, receiving a M.Sc. degree. After internal medicine residency training at Cornell, she did a clinical fellowship in oncology at Dartmouth and received a Howard Hughes Medical Institute Physician-Scientist Fellowship to study molecular mechanisms of oncogenic transformation with Dr. Charles Cole in the Department of Biochemistry at Dartmouth.

Dr. Conzen did a second postdoc with Dr. Nissam Hay at the University of Chicago, joining the faculty as an Assistant Professor in 1998. She rose through the ranks to become a highly accomplished physician-scientist and Professor of Medicine (Oncology) in the Ben May Department for Cancer Research.

Her laboratory made the novel observation that GR and estrogen receptor (ER) form a complex in ER-positive breast cancer and that GR modulates ER pro-tumorigenic activity through both cooperative and antagonistic transcriptional mechanisms. Dr. Conzen's group also demonstrated that high GR expression is a poor prognostic marker in ovarian cancers treated with standard-of-care surgery and chemotherapy. These findings have led to novel clinical trials of potential high impact in cancer.

Dr. Conzen is an elected member of the American Society of Clinical Investigation and is a past-Chairperson of the NIH Cancer Etiology Study Section and served as senior editor of Cancer Research.

As both a practicing medical oncologist and an NIH-funded physician scientist, Dr. Conzen brings to Texas NCI grant funding to investigate glucocorticoid receptor (GR)-mediated survival in breast cancer. She will focus her research at UT Southwestern on the role of GR-mediated regulation of premalignant and malignant transcriptional networks in prostate, breast, and ovarian cancers. Understanding the way in which GR activity is relevant to tumor evolution and therapy is a promising area as is the function of the GR receptor in the tumor immune environment.

Dr. Conzen's work has a strong translational rationale given that several highly specific modulators of the GR are currently in early stage clinical development.

PRODUCT DEVELOPMENT RESEARCH PROGRAM AT-A-GLANCE

CPRIT's Product Development Research Program funds projects at Texas-based companies developing novel cancer products or services. Product development activities translate a novel laboratory finding into a safe, reliable product available to treat cancer patients. CPRIT supports projects that accelerate the development of promising research discoveries through the crucial preliminary stages of regulatory testing. CPRIT invests in early stage companies where private capital is hardest to obtain. Although CPRIT provides only a small portion of the total funding required to bring a treatment to market, CPRIT's investment is critically important because it funds necessary early state development activities, laying the foundation for further progress.

DRUGS, DIAGNOSTICS, DEVICES

CPRIT invests in product development across multiple sectors of the cancer market including drugs, diagnostics, devices. Two-thirds of CPRIT's Product Development Research grants support projects at companies developing novel drug, cell, and biologic therapies for cancer patients. The remaining program investments fund projects related to development services, diagnostics, and devices.

CLINICAL TRIALS

17 CPRIT-funded companies have treatments in clinical trials during fiscal year 2019, with 675 enrolled patients. This clinical research confirms the safety and efficacy of the new treatment, as well as necessary steps for regulatory approval before it is available to patients.

8	CPRIT Awards Approved in FY 2019
$56.6M	Grant Funds Committed in FY 2019
$437M	Grant Funds Committed to 36 Companies since 2010

SELECTING PROMISING COMPANIES

34 peer reviewers evaluated 70 product development research applications submitted in fiscal year 2019. Applicants undergo a merit-based, multi-stage selection process by subject matter expert peer reviewers. Before peer reviewers make final award recommendations, compelling applications also undergo due diligence review.

TEXAS COLLABORATIONS

Twenty-five companies have connections with Texas institutions to work on the companies' CPRIT-funded projects, including research, manufacturing, and clinical trial support. These company/institution collaborations strengthen the state's life science infrastructure and ecosystem.

ADDITIONAL FUNDING RAISED

CPRIT's Product Development Research Program has committed $437 million to 36 Texas companies. In turn, the CPRIT companies have raised $3.2 billion in additional investments after their CPRIT awards. The companies' ability to leverage CPRIT's early investments at a rate of 7:1 validates external investors' confidence in CPRIT's peer review and due diligence processes.

CPRIT'S PRODUCT DEVELOPMENT PROGRAM'S APPROACH TO INVESTING STRATEGICALLY

- Support the commercial development of novel products to address unmet cancer diagnosis and treatment needs
- Stimulate the Texas life sciences ecosystem by funding in spaces where private capital is most difficult to obtain, known as the "Valley of Death" between research and private funding
- Invest in projects based on sound scientific research with strong management and sound business plans that will be attractive to private investment
- Provide an appropriate return on Texas taxpayer investment

CPRIT disburses grant funding to the company in tranches based upon documented progress and may terminate the funding if the company is not meeting its contractual objectives. Award contracts also include a royalty obligation payable to the state post commercialization. CPRIT's revenue sharing terms provide appropriate return to Texas taxpayers and are structured so that the company can attract subsequent investors.

NOTABLE PRODUCT DEVELOPMENT PROGRAM HIGHLIGHTS FOR FISCAL YEAR 2019

CPRIT awards its first "Seed" Awards to three companies in fiscal year 2019. CPRIT created the Seed Award to support late translational research and proof of concept data generation for early-stage companies developing a compelling discovery related to a novel drug, medical device, diagnostic tool, or other oncology product.

CPRIT grantee Molecular Templates, Inc. a clinical-stage oncology company focused on the discovery and development of the company's proprietary engineered toxin bodies (ETBs), closed a $662.5 million deal with Takeda Pharmaceuticals to co-develop targeted ETBs for the treatment of multiple myeloma and other cancers.

Dr. Cindy WalkerPeach joined CPRIT as its Chief Product Development Officer in February. Dr. WalkerPeach brings extensive technical experiences in oncology, infectious diseases, and inherited disease molecular diagnostics, and has led numerous successful clinical product development teams. She most recently served as Innovation-Corps (I-Corps) Program Director at the National Science Foundation.

One of the first CPRIT-supported companies, Peloton Therapeutics, secured $150 million in financing in February 2019 to fund the company's Phase 3 clinical trial for patients with metastatic renal cell carcinoma and develop treatments for patients with Von Hippel-Lindau disease, a familial cancer syndrome for which there are no approved drugs. U.S. drug maker Merck & Co. Inc. agreed to buy the Dallas-based company in June for $1.05 billion in cash, gaining access to Peloton's lead kidney cancer drug candidate. The total acquisition may reach $2.2 billion.

The FDA accepted Dallas-based OncoNano Medicine, Inc.'s Investigational New Drug application for ONM-100, an intravenously administered imaging agent to detect tumors and metastatic lymph nodes in solid cancers during surgery. OncoNano also received Fast Track designation from the FDA. The company, a spinout from The University of Texas Southwestern Medical Center, is developing nanotechnology-enabled fluorescent probes to help cancer surgeons excise tumors and completed its an initial financing round in July, raising $35.4 million.

The US Patent Office granted the 100th patent to CPRIT grantee Immatics, underscoring the company's lead role in the field of innovative immunotherapies. The Houston-based company also announced a collaboration with Roche to evaluate the safety and efficacy of Immatics' autologous cell therapy, in combination with atezolizumab, in patients with solid cancers. The University of Texas MD Anderson Cancer Center will conduct the combination clinical trial.

CPRIT grantee Salarius Pharmaceuticals, Inc., a Houston-based clinical-stage oncology company targeting the epigenetic causes of cancers, began trading on the Nasdaq Capital Market under the new ticker symbol "SLRX." In recognition of this milestone, the Salarius management team rang the opening bell for Nasdaq on July 30, 2019.

CPRIT-SUPPORTED RESEARCH FINDINGS REPORTED BY PRODUCT DEVELOPMENT GRANTEES IN FISCAL YEAR 2019

AlloVir (formerly known as Viracyte) published results from its Phase 2 study in the *Journal of Clinical Oncology*, **finding that 93 percent of treated patients demonstrated a clinical response following treatment with the company's lead drug candidate** funded by CPRIT. The company closed on a Series B financing worth $120 million.

Aravive, Inc., announced that preliminary efficacy data from their ongoing clinical trial with AVB-500 showed **compelling anti-tumor activity in the 12 patients treated from the first cohort of the ongoing Phase 1b portion of the Phase 1b/2 trial** of the company's lead compound, AVB-500, in patients with platinum-resistant recurrent ovarian cancer. The Houston-based company received a $20 million CPRIT Product Development Award in November 2015 to develop its lead targeted therapy against acute myeloid lymphoma and certain solid tumor indications including ovarian, pancreatic, and breast cancer.

Asuragen, Inc., a molecular diagnostics company in Austin delivering easy-to-use products for complex testing in genetics and oncology, published a study done in collaboration with University of Texas MD Anderson in the journal *Translational Oncology*. The CPRIT-supported study **demonstrates a single next-generation sequencing workflow for the sensitive and accurate detection of DNA and RNA variants associated with non-small cell lung cancer**.

Bellicum Pharmaceuticals, Inc., **reported its first data from 12 patients enrolled in a Phase 1/2 dose escalation study in PSCA-positive metastatic pancreatic cancer treated with BPX-601**, a novel CAR-T drug with a built-in application switch to boost its effects. Data showed that four out of six evaluable patients had stabilized disease, with two patients' tumors shrinking at least 20%. More importantly, the results suggest BPX-601 is working as intended.

Cell Medica announced that it **successfully dosed the first neuroblastoma patient with innovative chimeric antigen receptor (CAR) therapy utilizing natural killer T cells** (NKT). The CAR-NKT therapy is targeting pediatric neuroblastoma. This is the first time an engineered NKT cell therapy has been used in humans. The company, with its U.S. headquarters in Houston, is collaborating with both Baylor College of Medicine and Texas Children's Hospital to carry out the Phase 1 study.

Cell Medica also presented data from the company's CITADEL study at the Society for Immunotherapy of Cancer 2018 Conference. Cell Medica **reported early results from a Phase 2 study of autologous EBV-specific cells for the treatment of advanced NKT-cell lymphoma**. Cell Medica received a $15.6 million CPRIT Product Development Award in March 2012 that supported the CITADEL trial. NKT lymphoma is a rare, aggressive lymphoma. The company conducted the CITADEL study in the U.S. (including two sites in Texas), France, South Korea, and the UK. The 15-patient study demonstrated feasibility, clinical activity, and safety of administration of single agent autologous EBV-specific T cells in patients with relapsed NKT

lymphoma in a multicenter, multinational trial. Cell Medica is planning to perform validation in a larger cohort.

Medicenna Therapeutics **reported promising interim efficacy and safety results in late 2018 from patients treated at low doses in the on-going Phase 2b clinical trial of its lead compound, MDNA55 for recurrent glioblastoma (rGBM)**, the most common and uniformly fatal form of brain cancer. Results showed promising median overall survival of 9.8 months following a single treatment for the 27 enrolled patients, with an overall survival rate of 89% at 6 months, 58% at 9 months and 47% at 12 months. According to the company, this materially exceeds survival rates reported for approved drugs for rGBM; survival rates for MDNA55 at 6, 9 or 12 months are 44% to 81% better than that of Avastin and 35% to 57% better than Lomustine. In April, Medicenna completed enrollment of the Phase 2b clinical study. The Houston-based company studied MDNA55 in five clinical trials involving 132 patients, including 112 adults with rGBM. MDNA55 has Fast-Track and Orphan Drug status.

OncoNano Medicine, Inc., **announced the end of a Phase 1a clinical trial and expansion into Phase 1b to evaluate ONM-100**, an intravenously administered imaging agent to detect tumors and metastatic lymph nodes in solid cancers during surgery. Surgery is the standard treatment for most solid tumors, with postoperative margin status and tumors left behind being the leading prognostic factor to predict tumor metastasis and potential recurrence.

Despite tremendous advances in imaging modalities, current techniques do not provide real-time feedback and surgeons must rely upon pre-operative imaging data and what they observe during surgery. ONM-100 targets the acidic pH environment within tumors, providing surgeons with a method to assess lymph nodes and tumor margins in real-time. ONM-100 features a digital on-off response to pH changes – switching on in the tumor's acidic environment and remaining off in blood circulation and normal cells. OncoNano received a $6 million CPRIT Product Development Award in August 2014, which provided support for the development of ONM-100.

Salarius Pharmaceuticals, Inc., **enrolled the first patient in its Phase 1 clinical study of the company's lead compound, Seclidemstat**, in patients with advanced solid tumors resistant to standard-of-care therapies. This is the company's second Phase 1 clinical study for Seclidemstat, which is also the subject of an ongoing clinical study focused on Ewing sarcoma, a devastating bone and soft tissue cancer. Seclidemstat has Orphan Drug Designation and Rare Pediatric Disease Designation from the U.S. Food and Drug Administration (FDA).

Houston-based Aravive Biologics, Inc., received a $20 million CPRIT Product Development award in 2015 to support the development of a novel drug technology to treat ovarian cancer, a disease with high unmet medical need.

CPRIT's investment supported Aravive's development of a novel therapeutic, known as AVB-500, over the course of three years, including activities such as preclinical studies, filing of an investigational new drug application (IND) with the FDA, a Phase 1 healthy volunteer study, and a Phase 1b clinical trial in platinum-resistant ovarian cancer patients. The company is currently conducting a Phase 1b/2 clinical trial of AVB-500 in platinum-resistant recurrent ovarian cancer patients.

Prior to CPRIT funding, Aravive demonstrated effectiveness of AVB-500 in decreasing metastatic disease in several cancer types in animal models. CPRIT's investment allowed Aravive to take the lead drug candidate through several critical development stages, including preclinical testing, clinical studies, and manufacturing.

With CPRIT's funding, the company developed a serum biomarker assay and demonstrated AVB-500's safety profile, providing Aravive the necessary supporting data to test AVB-500 in a healthy volunteer study. The study identified a drug dose that was pharmacologically active for a Phase 1b platinum resistant ovarian cancer study, critically shortening conventional oncology drug development timelines.

Preliminary data from the Phase 1b platinum-resistant ovarian cancer trial suggests patients receiving AVB-500 in combination with paclitaxel or pegylated liposomal doxyrubicin (PLD) experience a clinical benefit above that experienced with paclitaxel or PLD alone.

In addition to continuing development of AVB-500 for ovarian cancer, the FDA has cleared the company to begin clinical trials of AVB-500 as a treatment of clear cell renal cell carcinoma.

Instapath, Inc., received a $3 million CPRIT SEED Product Development Award in 2019 to support the development of an innovative biopsy imaging device to improve cancer diagnosis. The CPRIT Seed Award supports very early-stage companies to demonstrate initial proof-of-concept/early prototype development work on the path to commercial product development. Understanding the cellular composition of tissues removed during a biopsy or other medical procedure allows physicians and clinical diagnosticians to provide improved assessment of the harvested tissues and aid in the most accurate diagnosis and follow-on treatment planning.

Available biopsy technologies do not allow laboratorians to preview the entire tissue without destroying it, which makes the tissue unusable for further testing. Additionally, the results from a low-quality sample often lead to repeat procedures causing patience pain and anguish. Instapath's technology introduces an innovative way to evaluate the composition of the entire fresh tissue sample in a matter of seconds at the point-of-procedure and preserves the tissue for downstream clinical testing.

CPRIT's investment supports the Houston-based company's next steps in prototype medical device development, regulatory certification, and clinical testing to transfer this technology from a research-use only prototype instrument into a medical device available on the market for clinical laboratory personnel and physicians.

Molecular Templates, Inc., received two CPRIT Product Development awards, a $10.6 million award in 2011 and a $15.2 million award in 2016, to support the company's development of two novel drug candidates – one designed to treat certain types of lymphoma and another targeting multiple myeloma.

Austin-based Molecular Templates' first CPRIT award supported the clinical development of a novel drug known as MT-3724. In March 2019, the company announced the initiation of a Phase 2 clinical study in relapsed/refractory diffuse large B-cell lymphoma (DLBCL) patients. DLBCL is the most common subtype of Non-Hodgkin's lymphomas. The multicenter clinical study (clinicaltrials.gov identifier NCT02361346) will enroll up to 100 DLBCL patients. The company has announced plans to release the preliminary results in 2020.

The company received a second CPRIT award to support the development of a novel drug targeting multiple myeloma. In 2015, there were 27,000 new cases of multiple myeloma diagnosed in the U.S., making it the second most prevalent blood cancer. The five-year survival rate for multiple myeloma is 45% and the median survival is about four years. In June, the FDA accepted Molecular Templates' investigational new drug (IND) application to conduct a Phase 1 clinical trial in relapsed/refractory multiple myeloma patients, which will be supported with CPRIT funds.

PREVENTION PROGRAM AT-A-GLANCE

Half of all cancers are preventable but the ability to meaningfully reduce cancer death rates depends, in part, on applying currently available evidence-based prevention interventions more broadly. Through its Prevention Program, CPRIT invests in evidence-based community interventions so that innovative technologies and services are available across the state, with priority given to medically underserved areas and populations. CPRIT's prevention grant awards make it possible for cancer prevention interventions and services to reach more Texans to save lives and reduce the burden of cancer.

17	FY 2019 Prevention Grants Awarded
226	Total Prevention Grants Awarded to 53 Texas Institutions and Community Organizations
$26,826,443	FY 2019 Prevention Grant Funds Awarded

REDUCING CANCER DEATH RATES

Because of proven prevention interventions, early detection, and better treatments, cancer mortality rates are steadily declining. Texas has seen an eight percent drop in the death rate from cancer between 2011 and 2017 (the latest data available). Over that six-year period, efforts across TX addressing cancer incidence and mortality have potentially averted 10,537 deaths.

DELIVERING SERVICES TO TEXANS

CPRIT Prevention Program grantees have delivered 5.7 million services to Texans as of August 31, 2019. These include 2.9 million education and training services and 2.8 million clinical services such as screenings and diagnostic services, vaccinations, tobacco cessation, genetic testing and counseling, and survivor care services.

ACTIVE PROJECTS

76 Prevention Program projects provided programs and services to Texans this year. Of the 76 active projects, 37% focus on primary prevention, 54% on secondary prevention, and 9% on tertiary prevention.

SELECTING THE BEST PROJECTS

33 peer reviewers evaluated 51 prevention applications submitted in fiscal year 2019. CPRIT prevention grant applications undergo peer review by prominent public health experts from outside of Texas who assess the project's merit and potential impact on cancer. Reviewers also evaluate programmatic considerations, such as geographic distribution, cancer type, population served, and type of program or service.

DETECTING CANCER EARLY

As a result of the screening and diagnostic services, CPRIT grantees have detected 22,500 cancers and cancer precursors. More than 370,000 Texans received their first cancer screening through CPRIT projects. Detecting cancer early not only increases the likelihood of surviving cancer, but also minimizes the overall cost of cancer treatment. Experts estimate that every $1.00 spent for screening equates to $25.75 treatment cost savings.

CPRIT FUNDS QUALITY PREVENTION PROGRAM PROPOSALS FOCUSED ON:

- Primary prevention: Reducing risk or preventing cancer from occurring (e.g., vaccine-conferred immunity, tobacco cessation);
- Secondary prevention: Early detection of cancer to prevent it from spreading and treating diagnosed cases when the opportunity for greatest success exists (e.g., screening/early detection for breast, cervical, lung, and/or colorectal cancer); and
- Tertiary prevention: Reducing risk of recurrence and improving quality of life for survivors and families (e.g. physical rehabilitation/therapy, psychosocial interventions, palliative care).

The Prevention Program prioritizes evidence-based interventions and funding interventions across the prevention continuum. CPRIT funds programs and services, for any cancer type, that are culturally appropriate for the target population and validated by documented research or applied evidence.

NOTABLE PREVENTION PROGRAM HIGHLIGHTS FOR FISCAL YEAR 2019

The National Cancer Institute selected a CPRIT-funded project run by Dr. Navkiran Shokar, director for Cancer Prevention and Control at Texas Tech University Health Science Center El Paso, to include in NCI's database of Research-Tested Intervention Programs (RTIPs). RTIPs are evidence-based cancer control interventions and associated program materials designed to provide program planners and public health practitioners easy and immediate access to research-tested materials. Dr. Shokar's CPRIT prevention project "Against Colorectal Cancer in Our Neighborhoods (ACCION)" is a bilingual, community-based intervention designed to increase colorectal cancer screening among uninsured Hispanic adults.

Dr. Simon Craddock Lee, associate professor at The University of Texas Southwestern Medical Center, spoke at the NCI's Rural Cancer Control meeting about the CPRIT-funded BSPAN breast cancer screening project. Because of the program's impressive results, the Centers for Disease Control also invited Dr. Lee to present on the policy implications of the BSPAN program evaluation.

Dr. Paula Cuccaro, assistant professor of Health Promotion and Behavioral Sciences at The University of Texas School of Public Health, presented the findings of her CPRIT-funded prevention project, "Using Social Marketing and Mobile School-Based Vaccination Clinics to Increase HPV Vaccination Uptake in High-Risk Geographic Areas," at the 32nd International Papillomavirus Conference.

The Nursing Research & Evidence Based Practice Council presented Dr. Barbara Turner, the James D. and Ona I. Dye Professor of Medicine at The University of Texas Health Science Center at San Antonio, an award for her abstract, *Surveillance Compliance among Underserved & Insured Hereditary Cancer Mutation Carriers*. The abstract is based on her CPRIT project supporting a genetic services patient navigator.

A major outcome from a CPRIT Prevention Program grant project examining clinical practices used to increase HPV vaccination rates directed by Dr. Maria Jibaja-Weiss, Baylor College of Medicine, resulted in a Harris Health System-wide quality improvement effort. Led by nursing staff, the effort facilitated practice changes in all nineteen pediatric clinics.

First News at Four on KBTX in Bryan-College Station reported on Dr. Jason McKnight, faculty physician at the Texas A&M Physicians Family Medicine Center, and his CPRIT cancer prevention project, "Texas C-STEP," as part of its feature on colorectal cancer month. Texas C-Step offers free colorectal cancer screenings to low-income residents in the Brazos Valley. Nearly 900 colonoscopies were performed through the project, with a 27% cancer precursor detection rate and 10 cases of cancer detected; 54 family medicine resident physicians received colonoscopy training as well.

UH News featured "Taking Texas Tobacco Free," Dr. Lorraine Reitzel's CPRIT project at the University of Houston. Dr. Reitzel's program is reducing the incidence of tobacco-related cancers by assisting community behavioral health centers to adopt and implement comprehensive tobacco-free campus policies. During the first year of this project, seven substance use disorder treatment centers signed on to

participate; multiple other centers are in various stages of program implementation. Dr. Reitzel is also the project director of a CPRIT award to disseminate the "Taking Texas Tobacco Free" program across the state.

Dr. Michael Pignone's colorectal cancer screening project at The University of Texas at Austin Dell Medical School has doubled the percentage of CommUnityCare Health Center patients screened for colorectal cancer from 18.4% to 37% in just one year.

An article published in *UT Health News* for cervical cancer awareness month featured an interview with Dr. Paula Cuccaro of The University of Texas Health Science Center at San Antonio about her CPRIT-funded "All for Them" HPV vaccination project. The project recruited 28 Houston Independent School District middle schools to participate in the first year of this project and conducted mobile vaccination clinics at 21 schools.

Dr. Abbey Berenson with The University of Texas Medical Branch at Galveston spoke at Emory University about her extraordinarily successful CPRIT cancer prevention projects on overcoming barriers to HPV vaccination. Dr. Berenson's HPV vaccination project in pediatric clinics achieved an impressive 99% series completion rate, well surpassing national averages.

The Texas Tech University Health Sciences Center *Daily Dose* featured Dr. Rakhshanda Rahman's CPRIT project, "Access to Breast and Cervical Care for West Texas." This project, with additional expansion funding, has educated more than 26,800 women, provided more than 9,500 breast and cervical screening and diagnostic services, and detected 123 precursors and cancers since 2010.

Nurse Navigator in Cancer Genetics Kathryn Pratt at The University of Texas Southwestern Medical Center, presented findings on the impact of a genetic patient navigator (GPN) at the Oncology Nursing Society 44th Annual Congress. The CPRIT-funded project showed that introducing a GPN improved education on cancer risks, adherence to risk reduction behaviors, and genetic health literacy.

The *Vital Record*, a publication of Texas A&M University Health Science Center, featured Drs. Jane Bolin and Anna Lichorad's CPRIT-funded breast and cervical cancer screening project. These projects provide vital services to underserved women in the Brazos Valley while giving future nurses and nurse practitioners the opportunity to gain direct clinical experience. CPRIT originally supported this project, which provided services in nine counties, with a $1.5 million grant in 2013. CPRIT subsequently approved a $1.35 million grant in 2017 to expand the successful project to 17 counties.

Dr. Sally Vernon, Division Director of Health Promotion & Behavioral Sciences at The University of Texas Health Science Center at Houston, leads a successful project that developed, implemented and evaluated the Adolescent Vaccination Program (AVP), a bundled suite of strategies for increasing HPV vaccination in the Texas Children's Hospital network of 51 clinics. Through the CPRIT-supported project, vaccine initiation rates increased from 12.6% to 34.3% and completion rates increased 42%. Based on the success of her original project, Dr. Vernon's team subsequently received a CPRIT grant to implement this program clinic network in San Antonio and a CPRIT Dissemination grant to develop and disseminate a web-based implementation

tool for the adoption, implementation, and maintenance of AVP strategies, regardless of the size and type of pediatric clinic or network.

Dr. Mamta Jain of The University of Texas Southwestern Medical Center spearheaded the mobilization of a coalition of Texas physicians in support of removing access restrictions for Hepatitis C virus (HCV) treatment. She worked with the Alliance for Patient Access, a national network of physicians dedicated to ensuring patient access to approved therapies and to appropriate clinical care, as well as the National Viral Hepatitis Roundtable, a national coalition of more than 500 members working together to eliminate hepatitis B and C. Dr. Jain's CPRIT project focuses on HCV and Hepatitis B virus screening and access to treatment in Dallas County, El Paso, and four federally qualified health centers in South Texas.

Dr. Sally Vernon and team of The University of Texas Health Science Center at Houston have developed and implemented the Adolescent Vaccination Program (AVP) at Texas Children's Pediatrics, a large clinic network with 51 practices throughout five counties in the Houston area.

The AVP project, supported by CPRIT grant PP140183 "*Multi-component Interventions to Increase HPV Vaccination in a Network of Pediatric Clinics*," targets both healthcare providers and parents to increase initiation and completion of HPV vaccination among male and female patients ages 11-21.

The Centers for Disease Control estimate that over 90% of adolescents would start HPV vaccinations if healthcare providers talked with parents and recommended HPV vaccinations. The AVP project addressed significant barriers to vaccination, such as physicians' concerns about parents' negative perceptions of the vaccine, as well as safety concerns and lack of knowledge among parents.

Tools used in the AVP project included tailored messaging, continuing education for healthcare providers about HPV vaccination, and developing the HPVcancerFree online application.

Due to AVP's efforts, there was a 34% increase in vaccine initiation and a 42% increase in vaccine series completion over the grant period. Physicians reported greater confidence in addressing parental concerns about vaccinating a pre-teen. Parents were much more likely to agree that getting the HPV vaccine is good for their child's health, that it would protect their child from getting certain cancers, and that is important for the health of others in their community.

CPRIT awarded this team another CPRIT grant in 2019 to expand the AVP project to the Children's Hospital of San Antonio pediatric clinical network and to develop an online tool to enable clinic networks throughout Texas to adopt, implement, and maintain the AVP.

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The University of Texas MD Anderson Cancer Center, in partnership with family medicine programs at The University of Texas Medical Branch, The University of Texas Dell Medical School, and The University of Texas Health Science Center at Tyler, joined together for the CPRIT-funded project PP160027, "Improving Service Delivery to Cancer Survivors in Primary Care Centers", under the leadership of Dr. Lewis Foxhall. The project aims improve survivor care management by enhancing primary care physician awareness and knowledge of cancer survivorship care guidelines.

Few family medicine healthcare providers have a comprehensive understanding about long-term and late physical effects of cancer treatment, including the appropriate surveillance of cancer survivors to detect recurrent cancer, appropriate screenings for new primary cancers, psychosocial outcomes, and behavioral counseling.

Over 160 faculty and family medicine residents at three sites participated in monthly telementoring education to improve their skills in the treatment of cancer survivors.

The education caused a paradigm shift; providers became aware of the necessity to manage this distinct population's unique follow-up care needs. The faculty and family medicine residents at the

participating practices evolved from not knowing how many cancer survivors were in their practices to identifying, actively reaching out, and caring for cancer survivor's unique needs in the clinics.

The three practices saw more than 1,200 cancer survivors in survivorship visits and the percentage of patients having cancer treatment summaries and survivorship care plans dramatically increased over the course of the project.

This project also created sustainable practice-level changes at each of the three sites, creating a registry of cancer survivors and developing new care practice models. All sites have begun working with their local oncology partners to ease the transition from oncology to primary care and to continue to improve long-term follow-up and care for their patients.

The project partners are working toward establishing a Cancer Survivorship in Primary Care Intervention Network to bring quality survivorship care to vulnerable populations throughout Texas.

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Texans living in rural counties have a greater cancer burden than their urban counterparts due to barriers to care such as being uninsured, living at or below the poverty level, and having limited transportation. Since 2010, **The Rose's "Empower Her to Care" program** has delivered breast cancer screening, diagnostic, education, and patient navigation services to over 16,800 women in forty-one Texas counties.

The project, supported by CPRIT grant PP17091 "*Empower Her to Care Expansion: Increasing Access to Breast Cancer Screening and the Continuum of Care for Underserved Texas Women*," provides mobile mammography, serving women not previously reached and navigates patients into timely diagnostic testing and treatment. The project also uses patient reminders and provides transportation (the second most common reason people are not receiving care) to increase the number of women receiving breast cancer screenings.

Over 5,700 individuals received a mammogram for the first time through this project. Of the 350 breast cancers detected, 37% were diagnosed through these first-ever mammograms.

Ms. K, a patient at The Rose, recently described her experience: *"I found a lump in my breast. My doctor sent me to The Rose. I was scared and did not have insurance. I qualified for the CPRIT program and had the test I needed. I was diagnosed with cancer. I am grateful for CPRIT; the program saved my life."*

CPRIT Peer Review, Compliance Program and Conflict of Interest Information

CPRIT PEER REVIEW

Rigorous, independent, merit-based peer review is the foundation for CPRIT's grant programs. A scientific peer review process that vets and scores all grant proposals provides an objective evaluation of the proposed hypothesis, the methodology to prove the hypothesis, and the prospective findings.

Bias-free, expert reviews are the primary means for ensuring that CPRIT prudently invests the funds committed by Texans in projects with the greatest potential impact on cancer. From CPRIT's inception, its peer review process has included multiple safeguards to address potential conflicts of interest and ensure both fairness and accountability. In addition, since CPRIT makes awards only to organizations in Texas, it uses scientific experts who live and work outside of Texas to conduct peer review. This reduces potential conflicts of interest between the reviewers and the proposals under review.

CPRIT's evaluation of product development research proposals also includes an additional due diligence review of compelling applications. The due diligence review, performed by outside legal and regulatory experts, assesses the regulatory and commercial path of the proposed development project and underlying scientific discovery.

This level of review is unique to CPRIT among cancer grant-making organizations. It is consistent with CPRIT's objective to invest in research and development of discoveries with the highest probability of reaching and benefitting Texans as soon as possible.

Peer Review Recommendations and Oversight Committee Approval

CPRIT's three review councils —the Scientific Review Council, Prevention Review Council, and Product Development Review Council — oversee the peer review of all applications submitted to CPRIT. Members of the review councils chair the individual peer review panels within each program area. The councils assess the evaluations completed by the peer review committees and create a final list of proposals recommended for CPRIT grant awards.

The review councils submit their lists of recommendations simultaneously to the presiding officers of the CPRIT Program Integration Committee and the Oversight Committee. The Program Integration Committee meets first to act upon the review councils' proposed awards and to develop a final list of recommendations for Oversight Committee consideration.

The Oversight Committee acts on the Program Integration Committee's recommendations at its quarterly public meeting. Final approval for any grant recommendation requires a two-thirds vote of the Oversight Committee.

CPRIT's Peer Review Recognized by the NCI

The National Cancer Institute officially

designated CPRIT as an "NCI-approved funding entity" following a comprehensive assessment of CPRIT's peer review process to ensure it conforms to the standards set by the National Institutes of Health, including conflict of interest protections.

Achieving an NCI-approved funding entity designation is important because current and potential comprehensive cancer centers in Texas may include grant funding from NCI-approved funding entities as part of their research base calculations to earn or maintain NCI Cancer Center status. Maintaining a strong, conflict-free review process is another way that CPRIT enhances Texas' ability to leverage additional federal funding for cancer research and raises Texas' profile as a center for cancer research.

Peer Review Processes for CPRIT's Programs

The process charts on the following pages illustrate CPRIT's peer review process for the Prevention, Academic Research, and Product Development Research programs for fiscal year 2019.

CPRIT ACADEMIC RESEARCH PEER REVIEW PROCESS

STEP 1 Request for Application (RFA)	CPRIT releases a Request for Application (RFA) via the website, subscribers to CPRIT's email newsletter and the Texas Register.
STEP 2 Applying Online	Applicants submit proposals using CPRIT's online application receipt system (www.cpritgrants.org). Applicants must include information about all sources of funding, including private investors. Only applications submitted via the designated electronic portal are eligible for consideration of a grant award and applications are eligible only for the grant mechanism under which the grant application was submitted.
STEP 3 Administrative Review	Applications submitted by the deadline are checked for compliance against the application's administrative requirements and may be withdrawn at this step.
STEP 4 Reviewer Conflict of Interest (COI) Identification	Experts and advocates in cancer research are recruited by panel chairs, provisionally appointed by CPRIT's CEO and approved by the Oversight Committee. The reviewers access a non-confidential summary, a list of key personnel and sources of funding for every application. Reviewers flag potential COI. Some categories of COI may excuse a reviewer from reviewing any application submitted under the same grant mechanism.
STEP 5 Reviewer Assignment	Peer reviewers are assigned to panels in their area of expertise. Panel chairs assign applications to primary reviewers (usually 3 per application). At least one advocate reviewer is assigned to each panel. All reviewers live and work outside of the state. A list of members by panel can be found on CPRIT's website. A reviewer with a conflict does not participate in the discussion, presentation, or scoring of the application at any point in the process. Due to volume, research applications may undergo a preliminary evaluation using the process and criteria specified in the RFA.
STEP 6 Initial Scoring	An eligible application undergoes a rigorous peer review; the proposal is evaluated by (usually three) primary reviewers who provide an individual overall score. Individual overall scores are averaged to produce a single initial overall score for the application.
STEP 7 Panel Discussion	The full peer review panel (12-15 reviewers) discusses the applications. If there is insufficient time to discuss all grant applications, the Review Panel chair determines applications to be discussed, based on initial scores. After discussion, each panel member provides individual overall scores that are averaged to provide a final overall score.
STEP 8 Final Scoring	Based upon the discussion and the scores, the peer review panel develops a rank ordered list of applications it recommends for grant awards. A final overall score and a summary statement of the reviewers' comments are provided to each applicant.
STEP 9 Review Council Recommendation	The Scientific Review Council, consisting of the Chair and panel chairs, considers the panels' recommendations and conducts a programmatic review. Criteria considered during programmatic review are spelled out in the RFA. The Council assigns a numerical ranking score to each application. The Council specifies and explains changes, if any, to the applications' goals, objectives, budget or timeline and these are provided to both the CEO and the Oversight Committee (OC). Once the review process is complete, all reviewers sign a statement that they have followed the CPRIT COI agreement terms.
STEP 10 Program Integration Committee (PIC) Review	The Program Integration Committee (PIC) considers the prioritized list of applications submitted by the Program Review Councils and approves by a majority vote a final list of applications to be recommended to the OC. The PIC includes an explanation for its recommendations.
STEP 11 Oversight Committee Action	The CPRIT CEO forwards the PIC's recommendations and provides an affidavit that each application complied with CPRIT's submission and review process. Two-thirds of the Oversight Committee members present and voting must approve each grant award recommendation submitted by the PIC. The CPRIT Compliance Officer also certifies each recommended award.
STEP 12 Grant Award Contract	All CPRIT grants are awarded through a contract that specifies the responsibilities and obligations of the award recipient and reflects certain reporting and legal requirements.

CPRIT PREVENTION PEER REVIEW PROCESS

STEP 1 Request for Application (RFA)	CPRIT releases a Request for Application (RFA) via the website, subscribers to CPRIT's email newsletter and the Texas Register.
STEP 2 Applying Online	Applicants submit proposals using CPRIT's online application receipt system (www.cpritgrants.org). Applicants must include information about all sources of funding, including private investors. Only applications submitted via the designated electronic portal are eligible for consideration of a grant award and only for the grant mechanism under which the grant application was submitted.
STEP 3 Administrative Review	Applications submitted by the deadline are checked for compliance against the application's administrative requirements and may be withdrawn at this step.
STEP 4 Reviewer Conflict of Interest (COI) Identification	Experts and advocates in cancer prevention are recruited by panel chairs, provisionally appointed by CPRIT's CEO and approved by the Oversight Committee. The reviewers access a non-confidential summary, a list of key personnel and sources of funding for every application. Reviewers identify which applications match their area of expertise and flag potential COI. Some categories of COI may excuse a reviewer from reviewing any application submitted under the same grant mechanism.
STEP 5 Reviewer Assignment	Peer reviewers are assigned to panels in their area of expertise. At least one advocate reviewer is assigned to each panel. All reviewers live and work outside of the state. A list of members by panel can be found on CPRIT's website. A reviewer with a conflict does not participate in the discussion, presentation, or scoring of the application at any point in the process.
STEP 6 Initial Scoring	An eligible application undergoes a rigorous peer review; the proposal is evaluated by (usually three) primary reviewers who provide an individual overall score. Individual overall scores are averaged to produce a single initial overall score for the application.
STEP 7 Panel Discussion	The full peer review panel (12-15 reviewers) discusses the applications. If there is insufficient time to discuss all grant applications, the Review Panel chair determines applications to be discussed. After discussion, each panel member provides individual overall scores that are averaged to provide a final overall score. A reviewer with a conflict of interest for an application recuses themself from the discussion and scoring of that application.
STEP 8 Final Scoring	Based upon the discussion and the scores, the peer review panel develops a rank ordered list of applications it recommends for grant awards. A final overall score and a summary statement of the reviewers' comments are provided to each applicant.
STEP 9 Review Council Recommendation	The Prevention Review Council, consisting of the Chair and panel chairs, considers the panels' recommendations and conducts a programmatic review. Criteria considered during programmatic review are spelled out in the RFA. The Council assigns a numerical ranking score to each application. The Council specifies and explains changes, if any, to the applications' goals, objectives, budget or timeline and these are provided to both the CEO and the Oversight Committee (OC). Once the review process is complete, all reviewers sign a statement that they have followed the CPRIT COI agreement terms.
STEP 10 Program Integration Committee (PIC) Review	The Program Integration Committee (PIC) considers the prioritized list of applications submitted by the Program Review Councils and approves by a majority vote a final list of applications to be recommended to the OC. The PIC includes an explanation for its recommendations.
STEP 11 Oversight Committee Action	The CPRIT CEO forwards the PIC's recommendations and provides an affidavit that each application complied with CPRIT's submission and review process. Two-thirds of the Oversight Committee members present and voting must approve each grant award recommendation submitted by the PIC. The CPRIT Compliance Officer also certifies each recommended award.
STEP 12 Grant Award Contract	All CPRIT grants are awarded through a contract that specifies the responsibilities and obligations of the award recipient and reflects certain reporting and legal requirements.

CPRIT PRODUCT DEVELOPMENT RESEARCH REVIEW PROCESS

STEP 1 Request for Application (RFA)	CPRIT releases a Request for Application (RFA) via the website, subscribers to CPRIT's email newsletter and the Texas Register.
STEP 2 Applying Online	Applicants submit proposals using CPRIT's online application receipt system (www.cpritgrants.org). Applicants must include information about all sources of funding, including private investors. Only applications submitted via the designated electronic portal are eligible for consideration of a grant award and only for the grant mechanism under which the grant application was submitted.
STEP 3 Administrative Review	Applications submitted by the deadline are checked for compliance against the application's administrative requirements and may be withdrawn at this step.
STEP 4 Reviewer Conflict of Interest (COI) Identification	Experts and advocates in development of products related to cancer research are recruited by panel chairs, provisionally appointed by CPRIT's CEO and approved by the Oversight Committee. The reviewers access a non-confidential summary, a list of key personnel and sources of funding for every application. Reviewers identify which applications match their area of expertise and flag potential COI. Some categories of COI may excuse a reviewer from reviewing any application submitted under the same grant mechanism.
STEP 5 Reviewer Assignment	Peer reviewers are assigned to panels in their area of expertise. At least one advocate reviewer is assigned to each panel. All reviewers live and work outside of the state. A list of members by panel can be found on CPRIT's website. A reviewer with a conflict does not participate in the discussion, presentation, or scoring of the application at any point in the process.
STEP 6 Individual Evaluation and Scoring	An eligible application undergoes a rigorous peer review; the proposal is evaluated by (usually three or four) primary reviewers who provide an individual overall score. Individual overall scores are averaged to produce a single initial overall score for the application.
STEP 7 Panel Discussion	The full peer review panel (12-15 reviewers) meets by teleconference and discusses the applications. After discussion, the primary reviewers may adjust their initial scores. The primary reviewers' individual overall scores are then averaged to provide an overall evaluation score for the application; the score and a summary statement of the reviewers' comments are generated for each application that does not move forward for further review. A reviewer with a conflict of interest for an application recuses themself from the discussion and scoring of that application.
STEP 8 In Person Presentations	Applicants with sufficiently positive scores after the panel discussion are invited to present their proposal to the full review panel and answer reviewer questions. Following the presentation, the reviewers discuss the application and all reviewers individually submit an overall score for the application. The individual overall scores are then averaged to provide a final overall evaluation score for the application; the score and a summary statement of the reviewers' comments are provided to each applicant. A reviewer with a conflict of interest for an application recuses themself from the discussion and scoring of that application.
STEP 9 Due Diligence Review	The applications that score sufficiently well after the in-person presentation undergo due diligence review conducted by outside contractors hired by CPRIT and overseen by the Chief Product Development Officer. Due diligence involves an in-depth evaluation of the proposal's underlying intellectual property, clinical trial design, regulatory affairs, manufacturability of product, marketing, etc. The due diligence reports are provided to the primary reviewers and the Product Development Review Council for their consideration.
STEP 10 Review Council Recommendation	Following a discussion of the due diligence reports, the Review Council conducts a programmatic review and decides which applications should be recommended for CPRIT grant funding. Criteria considered during programmatic review are spelled out in the RFA. All Product Development applications recommended for grant funding are numerically ranked by the Review Council and submitted to the Program Integration Committee. The Council specifies and explains changes, if any, to the applications' goals, objectives, budget or timeline and these are provided to both the CEO (as Chair of the Program Integration Committee) and the Oversight Committee (OC). Once the review process is complete, all reviewers sign a statement that they have followed the CPRIT COI agreement terms.
STEP 11 Program Integration Committee (PIC) Review	The Program Integration Committee (PIC) considers the prioritized list of applications submitted by the Program Review Councils and approves by a majority vote a final list of applications to be recommended to the OC. The PIC includes an explanation for its recommendations.
STEP 12 Oversight Committee Action	The CPRIT CEO forwards the PIC's recommendations and provides an affidavit that each application complied with CPRIT's submission and review process. Two-thirds of the Oversight Committee members present and voting must approve each grant award recommendation submitted by the PIC. The CPRIT Compliance Officer also certifies each recommended award.
STEP 13 Grant Award Contract	All CPRIT grants are awarded through a contract that specifies the responsibilities and obligations of the award recipient and reflects certain reporting and legal requirements, including revenue sharing terms and agreed upon milestones.

CPRIT COMPLIANCE PROGRAM

Texas law requires the Institute's compliance program to assess and ensure that CPRIT's Oversight Committee members and employees comply with applicable laws, rules, and policies. The program also provides fiscal and administrative oversight of all CPRIT grants to ensure that grant applicants and grantees follow rules, regulations, and laws, as well as internal codes of conduct, policies, and procedures.

CPRIT Employee and Oversight Committee Compliance

The compliance program ensures that each CPRIT employee and Oversight Committee member adheres to reporting and training requirements as provided in state laws, agency rules, and policies.

At least annually, all CPRIT employees and Oversight Committee members verify observance of CPRIT's Code of Conduct, affirm an agreement not to disclose confidential information submitted by grant applicants and grant recipients, and attest that they have no outside employment that conflicts with their CPRIT job or Oversight Committee appointment. All CPRIT employees and Oversight Committee members also complete periodic ethics training.

Compliance Certification for All Grant Award Compliance

The Chief Compliance Officer is responsible for ensuring that all grant proposals comply with the statute and administrative rules before the agency submits the proposals to the Oversight Committee for consideration and approval.

In fiscal year 2019, the Compliance Program initiated 771 grant compliance pedigrees. The Chief Compliance Officer certified 140 grant proposals for the Oversight Committee's consideration and approval.

A primary tool for identifying whether the grant review process complied with all required steps is the grant compliance pedigree. CPRIT creates a unique pedigree for each grant application. The pedigree identifies the actions taken from when CPRIT releases the Request for Applications through the peer review process, concluding with the Oversight Committee's final decision on the application. The compliance pedigree documents for the Program Integration Committee and the Oversight Committee that each grant award has met statutory requirements, administrative rules, and CPRIT procedures.

The grant compliance pedigrees and the Chief Compliance Officer's written certification are available in the *Proposed Grant Awards Book* associated with each Oversight Committee meeting. CPRIT posts all Oversight Committee meeting information on its public website.

Post Award Compliance Monitoring

CPRIT's compliance team, led by the Chief Compliance Officer, consists of a compliance program manager and six compliance specialists. This team continuously monitors active grants to ensure that each grant follows contract terms and conditions and applicable laws and reporting rules. CPRIT tracks due dates of required grantee reports through an electronic grant reporting and monitoring system.

Compliance specialists conduct reviews of grant reimbursement requests, providing second-level verification that the initial accounting reviews were thorough, consistent, and compliant with CPRIT's statutes, rules, and procedures.

In addition to the grant reimbursement reviews, compliance specialists assist with grantee training and technical assistance, support the development of grantee onboarding and annual training processes, and participate in the preventive desk reviews and the onsite review process for current grant recipients.

Risk Assessment Model

The Institute's compliance plan calls for the completion of a comprehensive risk analysis of awarded grants with the goal of determining monitoring coverage, type, priority, recommend staffing, and monitoring schedules for adequate oversight of grant recipients and associated grants.

CPRIT first implemented its risk assessment model in fiscal year 2016 and has updated it to reflect monitoring findings from the current fiscal year and recommended changes from the agency's internal auditor. The model considers several factors in determining grantee risk, including financial exposure, entity maturity, and prior experience administering grants.

CPRIT performs risk assessments on a quarterly and annual basis. Quarterly assessments evaluate new grant recipients that receive funding during the year. Annual assessments provide for ongoing reviews of grant recipients with multi-year awards and those who receive grants over multiple years. Each risk assessment assigns a priority ranking to grant recipients, which helps in determining training and monitoring needs.

Based on the results of the risk assessment, grantees receive a desk review or an onsite monitoring review. Compliance monitoring reviews evaluate a grantee's compliance with requirements included in Texas Administrative Code Chapters 701-703, Texas Health and Safety Code Chapter 102, CPRIT Policies and Procedures, Uniform Grant Management Standards, and terms of the grant contract.

Fraud, Waste, and Abuse Hotline

CPRIT opened a compliance and ethics hotline in fiscal year 2015. The dedicated hotline is part of the agency's ongoing efforts to protect the integrity of the

Institute's grant process and to protect state assets.

Individuals may use the system to report to the Compliance Program any concerns regarding fraudulent activity, theft, misconduct, safety violations, or unethical behavior regarding CPRIT-funded projects or activities. An independent contractor operates the service, which allows users the option to remain anonymous.

CPRIT publicizes the hotline to via training, CPRIT's Grant Management System, the Institute's website, and our mailing list to Oversight Committee members, staff, grant applicants, and grantees.

In fiscal year 2019, the CPRIT Compliance Team performed:


349 compliance monitoring reviews (332 desk reviews, 17 on-site reviews);


26 grantee training and education events, including annual compliance trainings, new grantee trainings, and trainings for new Authorized Signing Officials. More than 530 grantee staff attended these training opportunities provided to active grantees;


2,030 second-level reviews of grantees' Financial Status Reports (FSRs);


40+ single audit and agreed upon procedures report reviews and worked with five grantees to remediate audit findings; and


45 annual compliance attestation reviews and worked with four grantees to remediate deficiencies.

CONFLICT OF INTEREST INFORMATION FOR FISCAL YEAR 2019

Texas law prohibits any individual involved in making grant award decisions, including peer review panel members, Program Integration Committee members, and the Oversight Committee, from reviewing or voting on an application if the individual has a prohibited conflict of interest.

A conflict of interest exists if a reviewer or a close relative of the reviewer has a real or apparent interest in the outcome of an application such that the person may gain financially, professionally, or personally from the approval or disapproval of a grant application.

Most often the reviewer's conflict of interest with an application will require the reviewer's recusal only from the discussion and vote on that application. However, there are certain types of conflicts of interest that require the reviewer to recuse him or herself from the discussion and vote on all applications for the same grant mechanism in the same grant cycle. CPRIT refers to these type of conflicts as "super conflicts." An example of a one that CPRIT considers a super conflict is when the reviewer's relative is employed by or actively seeking employment with the grant applicant.

CPRIT relies primarily upon the individual peer reviewer to identify any conflicts of interest with all applications subject to his or her review. In addition, CPRIT posts the review panel membership on its public website. Doing so allows applicants the opportunity to separately notify CPRIT of any potential conflict of interest risks.

In exceptional circumstances, the participation of a reviewer outweighs the potential bias posed by the reviewer's conflict of interest. State law establishes a process for the Oversight Committee to approve a conflict of interest waiver to allow the otherwise conflicted reviewer to participate in the review process.

CPRIT maintains documents that list all conflicts of interest disclosed by reviewers, as well as the steps taken to show that the reviewer recused him or herself from the discussion and vote on the application at issue. This documentation includes a list of reviewers identifying conflicts and sign out sheets reflecting that the reviewer left the room (or the telephone call if CPRIT conducted the review discussion via conference call).

The Institute also contracts with an independent team to observe all peer review meetings and document any deviations from the required process. At the end of the review, the independent observer certifies that no reviewer with a conflict of interest in an application participated in the review or vote of that application.

CPRIT has an established process for reporting, investigating, and taking any necessary action for undisclosed conflicts of interest. In fiscal year 2019, there were no allegations of an unreported conflict of

interest that CPRIT could confirm after an investigation.

CPRIT posts information for all conflicts of interest requiring recusal in fiscal year 2019, including supporting documentation and the conflict of interest waivers approved by the Oversight Committee for fiscal year 2019, on its website at http://coi.cprit.texas.gov.

CPRIT Financials

CPRIT FINANCIALS

FINANCIAL SUMMARY (UNAUDITED) - FOR THE YEAR ENDED AUGUST 31, 2019	
Revenues	
Legislative Appropriations	$297,085,446
License, Fees, and Permits	305,491
Interest Income	9,803
Other	47,600
Total Revenues	**$297,448,384**
Expenses	
Salaries and Wages	$3,921,993
Other Personnel Cost	873,980
Professional Fees and Services	11,130,701
Travel	53,428
Materials and Supplies	297,345
Communication and Utilities	188,260
Repairs and Maintenance	1,471
Rentals and Leases	33,373
Printing and Reproduction	444
Grant Payments	211,525,293
Other Operating Expenditures	257,003
Capital Outlay	10,912
Total Expenses	**$228,224,875**
Excess of Revenues Over Expenditures	**$69,223,509**

CPRIT's Financial Position

CPRIT's executive management is responsible for establishing and maintaining adequate internal control over financial reporting and compliance with applicable laws, regulations, contracts, and grant agreements, as well as other matters.

McConnell & Jones LLP, a public accounting firm, audited CPRIT's financial statement for the year ending August 31, 2019, ascertaining that the statements "present fairly, in all material respects, the respective financial position of the governmental activities and governmental fund information of CPRIT as of August 31, 2019, and the respective changes in financial position for the year then ended in accordance with U.S. GAAP."

As part of the audit report on the financial statements, McConnell & Jones LLP reviewed CPRIT's internal control over financial reporting and performed tests of CPRIT's compliance with certain provisions of laws, regulations, contracts, and grant agreements to ensure that the statements are free from material misstatements. McConnell & Jones LLP identified no instance of noncompliance or other matter that required reporting under *Government Auditing Standards*.

Planning for the Future

PLANNING FOR THE FUTURE – CPRIT 2.0 AND TEXAS' FORWARD MOMENTUM

The CPRIT Oversight Committee and staff have engaged in strategic and operational planning over the past several years, addressing near-term and future opportunities to create and expedite innovation in cancer research and breakthroughs in the prevention of cancer and cures for cancer. This strategic planning will take on more urgency as we set the course for CPRIT 2.0 and the agency's activities over the next decade.

CPRIT's $2.4 billion investment in 1,452 of the best ideas in cancer research, product development, and prevention in Texas is building a vibrant life sciences and prevention infrastructure across the state. This groundbreaking work has enhanced Texas' competitive edge in the global fight against cancer.

From a foundation built through 10 years of steady investment, the state can now expand into new life science opportunities. Some ideas that CPRIT and its stakeholders discussed in FY 2019 as a preliminary framework for CPRIT 2.0 include:

- Capitalizing on CPRIT's longstanding investments in improving outcomes in childhood cancer; with continued support, Texas can be the world leader in childhood cancer research
- Grow and enhance the coalitions and networks delivering cancer prevention services by providing infrastructure to support them
- Creating and expanding research and treatment capabilities at universities in all regions of the state
- Boosting clinical trial options to more people by reducing the institutional and patient barriers to trials
- Increasing the number and breadth of Collaborative Action Programs (CAPs) that targets Texas-centric needs in cancer research and prevention. The CPRIT-initiated liver cancer CAP is addressing liver cancer, which Texas ranks first among states in incidence rate
- Taking advantage of the pipeline of novel cancer diagnostic and treatment discoveries at Texas universities by supporting the transition of early stage development in the growing number of Texas-based companies
- Doubling the number of NCI Comprehensive Cancer Centers and elevate Texas institutions' standing in prominent national reviews such as the *US News and World Report's* rankings through continued investment in research capacity, access to cutting-edge technology, and recruiting preeminent experts and the next generation of scientific leaders to Texas
- Co-investing with established bio-tech venture capital firms in promising Texas-based companies, sharing the risks and rewards equally

As CPRIT looks ahead to the next decade and considers what will do the most good for cancer patients and Texas, CPRIT will seek input and advice from stakeholders throughout the state. These include grant recipients, grant applications, expert advisors, the cancer advocate community, business leaders, community healthcare providers, venture capitalists, Texas institutions of higher education, and state leadership.

CPRIT will also provide opportunities for the people interested in future of cancer research and prevention efforts to provide input to the agency electronically and at Oversight Committee meetings.

The Oversight Committee is committed to a transparent, collaborative process, with the goal of laying out an actionable plan for CPRIT 2.0 in November 2020.